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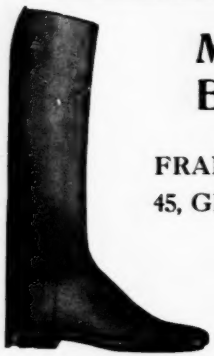

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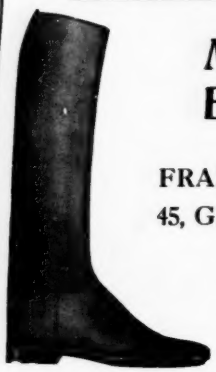

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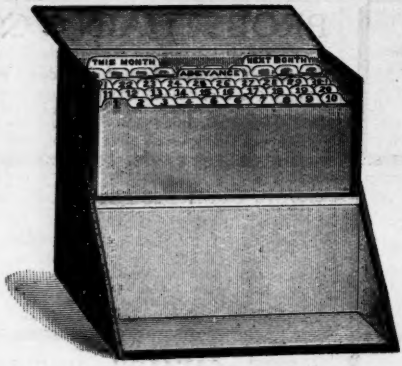

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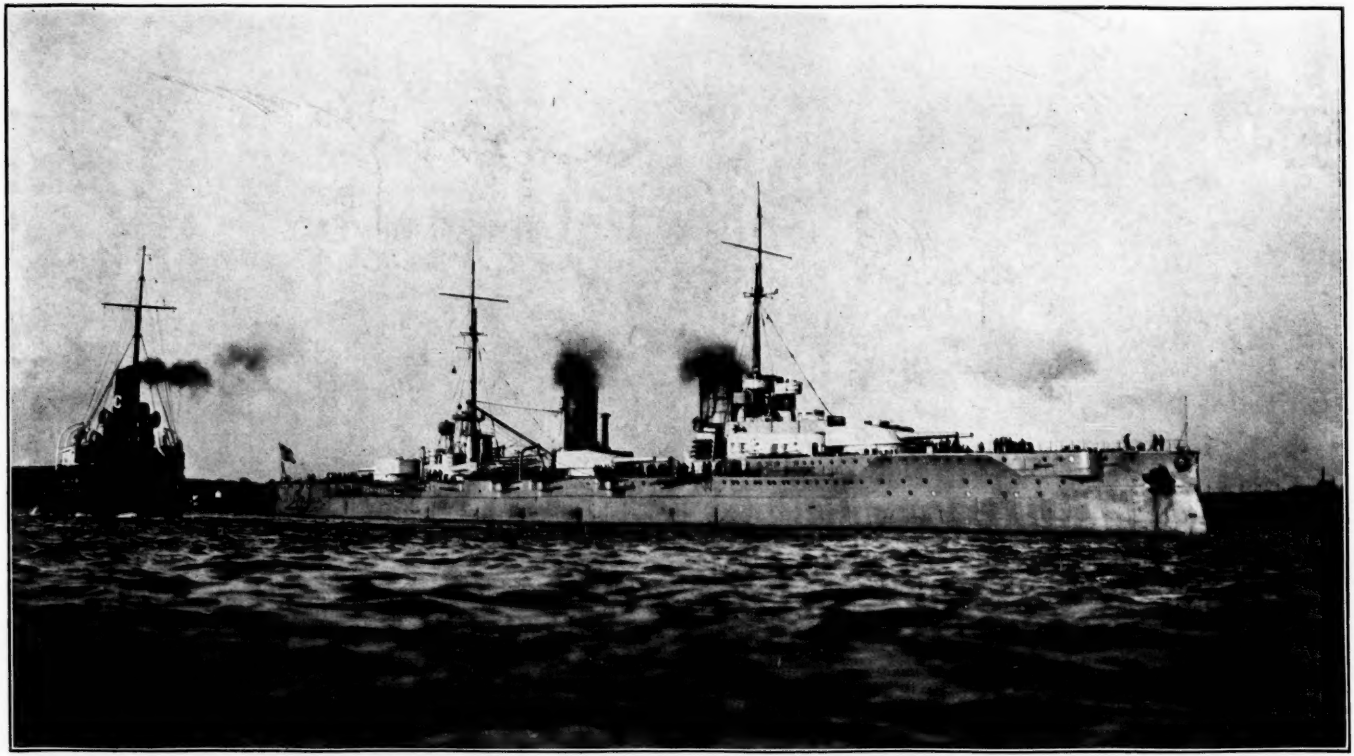

THE NEW GERMAN FIRST-CLASS ARMOURED CRUISER, "VON der TANN." 19,000 Tons; 44,000 designed I.H.P.; 26 Knots (28 on trials).
These figures are not official, and no details as to armour protection are available.

Armament: Eight 45-calibre 11-inch guns in pairs in four turrets, one forward, one aft, and one on each beam; ten 5.9-inch Q.F. and sixteen 3.5-inch Q.F. guns, with four submerged torpedo-tubes, for 19.5-inch torpedoes.

The "Von der Tann" is the first of the German "Dreadnought" cruisers to be completed, and she is leaving on an extended cruise to the South American Republics, to display the flag and show the great advance that has been made in German Warship construction.

THE JOURNAL

OF THE

ROYAL UNITED SERVICE INSTITUTION.

VOL. LV. MARCH, 1911. No. 397.

[Authors alone are responsible for the contents of their respective Papers.]

SECRETARY'S NOTES.

I. NEW MEMBERS.

The following Officers joined the Institution during the month of February:—

Lieutenant G. H. Gwyther, Royal Welsh Fusiliers.
Major H. D. Tuson, Duke of Cornwall's Light Infantry.
Lieutenant H. G. Sherbrooke, R.N.
Second-Lieutenant J. D. Bibby, 4th Hussars.
Major J. F. Anderson, 3rd Battalion Highland Light Infantry.
Lieutenant-Colonel R. Holbeche, late Royal Munster Fusiliers.
Captain W. Drysdale, Royal Scots.
Second-Lieutenant W. A. V. Bethell, 2nd Life Guards.
Captain E. P. F. G. Grant, R.N.
Second-Lieutenant V. M. G. Gordon-Ives, Coldstream Guards.
Second-Lieutenant L. M. Gibbs, Coldstream Guards.
Lieutenant-Colonel C. E. Phipps, late Madras Railway Volunteers.
Lieutenant H. B. Robinson, R.N.
Captain B. P. Lefroy, D.S.O., Royal Warwickshire Regiment.
Lieutenant W. J. T. Shorthose, South Staffordshire Regiment.
Captain H. E. Weekes, Indian Army.
Assistant Paymaster D. R. Thurstan, R.N.
Colonel E. P. Mainwaring, Indian Army.
Second Lieutenant G. G. Petherick, 2nd Life Guards.
Captain W. Mc C. Crosbie, Royal Munster Fusiliers.
Lieutenant-Colonel F. H. L. Errington, V.D., Inns of Courts O.T.C.
Captain W. Haire-Forster, Royal Irish Fusiliers.
Captain G. W. Howard, D.S.O., Essex Regiment.
Major-General A. K. Rideout, C.B., late R.A.
Captain E. L. Makin, Wiltshire Regiment.
Colonel S. E. G. Lawless, R.A.
Lieutenant J. K. Gordon, R.H.A.
Second-Lieutenant Hon. W. R. Bailey, Grenadier Guards.
Second-lieutenant G. A. Loyd, Scots Guards.
Captain D. Y. Watt, Leicester Regiment.
Lieutenant-Colonel R. M. Edwards, Indian Army.
Colonel A. Keene, D.S.O., late R.A.
Commander C. R. N. Burne, R.N.

II.—FATHER OF THE INSTITUTION.

Captain W. A. Tollemache, late 2nd Life Guards, died on February 4th, 1911. He was the oldest Member of the Institution, having joined in 1838, and was 93 years of age. He was the youngest son of Admiral Halliday and Lady Elizabeth Stratford, daughter of the last Earl of Aldborough. In 1821 Admiral Halliday took the name of Tollemache, on succeeding through his mother (Lady Jane Tollemache) to the family estates. The record of his life constitutes a link with the past. Born two years after Waterloo, and the son of a distinguished sailor, as a Westminster boy he witnessed the Coronation of William IV., and seven years later, as an officer of the 2nd Life Guards, was present at the midnight funeral of that Sovereign. He assisted in lining the streets when Queen Victoria made her royal progress through London on her Coronation. He was also a spectator of Queen Victoria's funeral, and witnessed the Coronation procession of King Edward VII. Captain Tollemache retired from the Army in 1846, and entered the Diplomatic Service. He was a frequent visitor to the Museum, and contributed several exhibits.

III. COUNCIL.

At the Anniversary Meeting held on Tuesday, March 7th, the following Officers were appointed to the vacancies on the Council :—

Admiral of the Fleet Sir G. H. U. Noel, K.C.B., K.C.M.G.
Vice-Admiral A. M. Field, F.R.S.
Rear-Admiral R. G. O. Tupper, C.V.O.
Lieutenant-General Sir R. S S. Baden-Powell, K.C.B., K.C.V.O.
Lieutenant-General H. D. Hutchinson, C.I.E.
Brigadier-General H. H. Wilson, C.B., D.S.O.
Brigadier-General F. I. Maxse, C.V.O., C.B., D.S.O.
Colonel F. C. Romer, C.B., C.M.G.
Lieutenant-Colonel Hon. T. F. Fremantle.

IV. GOLD MEDAL ESSAY 1910.

The Council has awarded the Gold Medal of the Institution, together with the first Trench-Gascoigne Prize of thirty guineas for the Naval Essay of 1910, to Capt. P. W. Game, R.H.A.

The second Trench-Gascoigne prize of twenty guineas has been given to Lieut.L. H. Hordern, R. N.

The subject of the essay was "How can the Colonies best help in the Naval Defence of the British Empire." The referees were :

Admiral Sir F. G. D. Bedford, G.C.B., G.C.M.G.
Rear-Admiral Cecil Burney.
Rear-Admiral C. G. F. M. Cradock, C.B., M.V.O.

The essays of

Captain A. R. Hulbert, R.N.
Major W. Cyprian Bridge, late South Staffordshire Regt.
Captain T. L. Shelford, R.N
Commander M. H. Cobbe R.N.

were recommended for publication.

V. VICE-PRESIDENTS.

The Council regret to have to announce the death of General Sir F. C. A. Stephenson, G.C.B., a Vice-President of the Institution ; he joined in 1844 became a member of the Council in 1873 and was its Chairman in 1873, 1875, 1877, and 1879.

VI. MILITARY HISTORY LECTURES.

The course of Military History Lectures on "The Franco-German War, 1870, from 15th July to 1st September," the subject for the Army Promotion Examination to be held in May, will take place as usual. The lectures will be delivered by T. Miller Maguire, Esq., LL.D., barrister-at-law The fee for the course of lectures is one guinea for Members of the Institution, and two guineas for non-members. The dates of the lectures will be as follows:—

Friday, April 21st.
Tuesday, April 25th.
Friday, April 28th.
Tuesday, May 2nd.
Friday, May 5th.
Tuesday, May 9th.
Thursday, May 11th.
Friday, May 12th.

The hour of each lecture will be 4 p.m. Application to attend, enclosing the fee, to be made to the Secretary, Royal United Service Institution, Whitehall, S.W.

VII. LETTERS.

Members are reminded that the Council can accept no responsibility in the matter of letters and telegrams addressed to them at the Institution, there being no arrangements for the reception and forwarding of Members' letters.

VIII. LECTURES.

Lieutenant-General Sir H. C. O. Plumer, K.C.B., will preside at the lecture to be delivered by Dr. Miller Maguire. on Wednesday March 22nd, on "Improvised Armies of the Nineteenth Century."

The Right Hon.R.B. Haldane, K.C.,M.P., Secretary of State for War, will preside at the lecture on Wednesday, March 29th, by Lieutenant-General Sir R. S. S. Baden-Powell, K.C.B., K.C.V.O., on "Boy Scouts."

IX. ADDITIONS TO THE MUSEUM.

(6287) Portugese Silver Medal to commemorate the first centenary of the Peninsula War. On the obverse is a Winged Figure of Victory sounding a trumpet, and bearing a Palm-leaf with the Royal Arms of Portugal at the base. On the reverse, an action in the War is represented, and is dominated by a figure of War leading on the allied troops, while the wounded are being succoured and carried from the field, and bearing the inscription in Portuguese: "To the Valour and Patriotism of the Portuguese People and Army 1808-1814."—*Given by General J. C. Rodrigues da Costa, of the Portuguese Ministry of War, and President of the Committee of the Peninsular War Centenary.*

(6288.) French cannon ball fired at the siege of Badajoz, unearthed some 60 years ago 50 yards to the West of the Picurina. The siege of Badajoz lasted from March 17th to April 5th, 1812, on which latter date it was taken by assault by the British. The total British losses during the siege exceeded 5,000.

(6289.) A portrait in oils of his late Majesty King Edward VII., executed in 1905. The picture was submitted to His Majesty, who expressed his approval of the likeness. Painted by Mr. Wilfrid B. Egan.—*Given by the Artist.*

(6290.) A line engraving by M. Vandergucht, from the painting by J. Saylmaker, entitled, "Gloria Brittanica, or the Royal Prince, built by Phin. Pett at Chatham." H.M.S. *Royal Prince* was built at Chatham in 1610, and was then the largest ship in the British Navy.

(6291.) Coattee, Shako with plate and chain, and buff shoulder belt and plate, of the East Norfolk Militia, 1854.—*Given by Colonel C. Haggard, late Royal Irish Rifles.*

(6294.) An engraving entitled "A View of His Majesty's Royal Ship, *The Sovereign of the Seas*," Captain Phineas Pett, supervisor, and Peter Pett, his son, master builders; built in 1637.

(6295.) Proof engraving of the arrival at St. Paul's Cathedral of Queen Victoria, on the occasion of her Diamond Jubilee, 1897.

(6296.) A naval officer's Sword, of about 1780.—*Given by Lieut.-Colonel W. H. M. Jackson, late 81st Regiment.*

(6297.) Model of a Venetian galley of the 17th Century period, which originally came from the Giustiniani Palace in Venice. —*Given by R. Howard Krause, Esq.*

(6298.) An infantry officer's sword, with brass hilt of about 1825, bearing the initials of King George IV.—*Given by Lieut.-Colonel W. H. M. Jackson, late 81st Regiment.*

X. CORONATION PROCESSION AND ROYAL PROGRESS.

It having been found impracticable to erect stands in front of the Institution Buildings for the use of Members, as was done on a previous occasion, H.M. Office of Works have consented to place at the disposal of he Council of the Institution, the following number of seats on their stands to be erected elsewhere on the route of both processions.

Coronation Procession on 22nd June, 800 seats.

Royal Progress on 23rd June, 1,500 seats.

The stands will be uncovered, and the exact position is not yet known.

Tickets will be allotted to Members on the following conditions—

1. Price of each ticket is 10s.
2. Members will be limited to the following number of tickets—June 22nd, two seats. June 23rd, three seats.
3. Tickets are not transferable; they may be used by Members and their relations only.
4. Applications for seats must be accompanied by a full remittance of 10s. per seat, and in addition a sum of 1s. application fee, (to cover the cost of printing, postage, and registration), and be addressed to the Secretary, Royal United Service Institution, Whitehall, S.W., endorsed on envelope *"Coronation."*
5. All applications with remittance must be received on or before March 28th.
6. Should the applications exceed the number of seats available, a ballot will take place, and those unsuccessful will have 10s. per seat returned.
7. Officers on the Active Lists must wear Full Dress Uniform, and it is desirable that those in the Retired Lists should do the same
8. Ladies need not be accompanied by a Member.
9. When seats have once been allotted, no refund can be made in consequence of any postponement or abandonment of the Processions.
10. No arrangements will be made to supply refreshments.

Foreign Members.—Owing to the time limit imposed by H.M. Office of Works for the receipt of applications and payment for these seats, the Council regret that it will in most cases be impossible to receive applications from Foreign Members in sufficient time to enable them to be included in the allotment, but it is hoped to secure a further limited number of seats for such Members at a laterdatefrom H.M. Office of Works, when tickets will be issued as far as possible under these conditions.

N.B.—The Institution will be open to Members only on the two days.

COLONEL HARWOOD'S ADVICE TO KING CHARLES I. ON THE DEFENCE OF THE COUNTRY

SIR EDWARD HARWOOD, born at Hagbourne in Berkshire, in 1586, was one of the four standing Collonells in the Low Countries, and was shot at the Siege of Maestricht, and was by Command of the Prince of Orange interred at the Hague in 1632.

When in command, it is recorded that "hee watched 30 "whole nights on Horseback, and never in that time came to "bed and by his providence and vigilancy discharged that "great trust and fully secured the countrey."

He having killed a man in a quarrel put a period to all his carnal mirth. Hugh Peeters, in his account of him says:— "Thus much I must say of him: He was true to his Principles "(a rare virtue in his age). Hee was neither above, nor below "his Calling, but very adequate and true unto it; So sad, seri- "ous, and skillful in his way, Hee was a good man, a good "Souldier, a good Christian, and is now wearing his Crown."

The following Report was written by Command of His Majesty King Charles I.:—

COLLONELL HARWOOD'S ADVICE TO KING CHARLES.

Or, A Discourse on the Rumour of the French King's Preparation at Sea.

The particulars of his preparations not being certainely knowne, there is no certain judgement to be made of them; I will therefore only take the case, as I suppose it will be granted. That the French King endeavours to make himself strong at sea, and that by two meanes, one encouraging his subjects to trade at sea, giving his Merchants great priviledges, and immunities, another of his owne proper Cost, buying, and building many great and good ships, and ordaining a yearely brave proportion out of his revenue, for the increasing and maintaining his Navie, as some say 300 thousand l. sterling, others but 300 thousands Crownes, one or other, are considerable, and may prove of danger to this State. For this disposition of his argues, that hee intends either to enter into a new war with his Majestie, or at least, to put himselfe into such a condition, as when he shall think fit, hee may doe so, without his disadvantage. That this his Arming at sea, must be intended, in emulation of His Majesties Lordship of the narrow Seas, to equall, ore-top him at sea is probable. For against whom else: Not against the Hollanders, they are his obsequious friends, desirous of his friendship, fearefull of his displeasure, not against the King of Spain for he can more easily invade him by land, when hee will, as Spain can him; Besides, the French King shewes no disposition to enter into open warre with him, for having taken on him the protection of Mantua, and not well dealt with by him in the last treaty for Italy, making a peace in shew, and yet after taking his advantage, renuing the warre in the Emperour's name, yet doth he not enter into open warre with him, but will only be an assistant, else had it not beene more facile for him to have invaded Flanders or Artois, and so by diversion aided the Duke of Mantua, then by sending an Army into Italy in the winter; therefore this preparation of the French King, for the sea, hath his chiefe ayme, in present, or future at His Majestie. I suppose, not to invade England, or it may be none of His Majesties Ilands, though that is more than we can be assured of; some of his ships of warre were this winter on His Majesties Coast, went from Harbour to Harbour, doubtless to discover them and not for any good to His Masjestie: besides, who can tell, since the Ilands of Garnesey and Jersey, are the only remainders of the large Dominions, His Majesties Predecessors formerly have possessed in France, if hee have not an itching to joyne them to France again, or if not them, nor Wight; yet to share the dominion of the narrow Seas with His Majestie, and that is to take it from him, if he can; to which hitherto hee hath not pretended, as not being able to match His Majestie at Sea, but if he continue these His preparations, and that His Majestie out of hand prepare not also against it, hee will in short time, undoubtedly effect it. It will be said (it may be) hee hath no good ports or havens: that is an errour; it is true, he hath not so many good harbours, as His Majestie hath, yet some he hath, not inferiour

to any of His Majesties, it may be also said that his Subjects are not so proper for the Sea, nor so affected to trade, as his Majesties are: it is true, but if he continue to encourage his Merchants, turne Merchant himself, will not his Princes, great Lords and Gentlemen, follow his example: For Saylors, if they give great pay, and pay well, he will not want them of other Nations; nay, if his Majesties owne Subjects have not the like great and good payment, it is to be feared, he may draw many of his, to his service, at first, untill there be open warres twixt the Kingdomes: for doe not, at this present, many hundreds, I might say, thousands of his Majesties Subjects, serve other States at Sea; as the Hollanders, nay, the Turkes, without either leave, or knowledge of his Majestie.

Now, if the French King should come to be as powerfull, or more, then his Majestie at Sea, he will be a more dangerous and fearfull neighbour to England than Spaine, whom hitherto this Kingdom have of latter yeares onely had cause to feare, for that against Spaine, the Low Countries will ever bee a good Bulwarck; who if the King of Spaine at any time, make any great preparations at Sea, will be ever jealous, it is intended against them, and so ever arme against him, and be alwaies ready to joyne with, and to assist his Majestie 'gainst Spaine, which may bee doubted, they will not so readily doe against France, with whom they are in league, and not jealous off. Besides the King of Spaine hath not so populous a Countrey, as hee can easily prepare, either a great Fleet, or Land Army, and much lesse both, without long time, and so his Majestie may have the more warning thereof. Then Spaine is further from England and so the journey is longer, and from thence cannot come any Horse, which are the forces most to be feared in England. Whereas France being so neere us, and so full of Souldiers, both Horse and Foot, if it once come to be able to equall England at Sea, by sudden and quicke preparations, stealing opportunities, he may oretop England at Sea, and then transport such an Army of Horse and Foot, as we might justly be afraid of: For old Souldiers both Horse and Foot, France abounds in, and the French have a virtue proper to them, that not a Gentleman thinkes himself anything, untill he have seene the Warres, learned at least, good and perfect use of his Armes, and naturally they are all good Horsemen; their Land affords Horses fit for service, and every man almost knows to use Pistoll and Carabin: Whereas in England, unlesse those, which have been Souldiers, few or none can use their Armes, and of those which have bin Souldiers, it may be not all, can well use their Armes, especially the Musquet, which is of most offence, which our Nation are not naturally so prompt to learne the use of, as the French are; and for Horse, this Kingdom is so deficient, as it is a question, whether or not, the whole Kingdome could make 2,000 good Horse, that might equall 2,000 French.

To redress these deficiences, in all humility, I here present my poore and slender advice, under correction, and with submission to better judgments.

First, and principally I would advise that his Majestie would arme at Sea, for that is the surest defence, for we can never be hurt by a forraigne enemy, by land, till we be first beaten at Sea, and therein I cannot give better advise, than to do what the French King doth, as to repaire and increase his own Royall Navie, which is the greatest and best assured strength of England, and to that end, to set apart some certain large proportion of his revenue, that His Seamen may have good pay, and well paid, and if there be good and strict courses taken, that there be no abuses in the Musters, victualling, consumption of Ammunition (which without good payment cannot well be executed) His Majesty will be a Gainer thereby, in matter of profit, besides, the reputation and advantage of his service, and it is my opinion, that no Prince nor State, but had better give 40 in the hundred, for monies to pay his Militia well, then not to pay well: Then to encourage his Merchants, and other Subjects to trade, and in making new plantations. For his land-forces, that His Majestie would take order, that the numbers of trayned men were increased, or rather that the whole Kingdome from 18 or 20 to 35 or 40, as many as were able of bodies were armed, one third with pikes and armours, another with muskets, and the third with calivers, that there were powder, bullets, and match through the whole Kingdome, magazines thereof in sundry places of the Kingdome in such a quantity, as if it were invaded in one, or divers parts, there be no want of Ammunition in any place: for it would be then too late to fetch it elsewhere, and much worse, then to make it, or send over Seas for it. That there were Care taken, that these men then armed might be well exercised, and to that end, that there be in every hundreth, or wapentake, some old souldier, Sergeant, or other inferior Officer, had out of the Low Countries well chosen, that might teach men the use of their Armes, and that there be certaine dayes set and appointed, for the shewing of their Armes, and exercising them; and if the Statutes which were formerly for sporting in the long bows were revived, or converted (with deliberation) for the musket and Caliver, to practice by shooting at markes on ordinary Holy-days, and such like times, and at some time some small prize for them, that shoot nearest; under correction, I think it were much for the strength of the Kingdome: Then that there were good choyse made of the Muster-masters, none to be but such as had borne office in some actuall warre of reputation; for better there were none, and their allowances divided into sundry inferior men, then for one to draw a great pay, that either knowes not to doe, or doth not anything for it: and because there is, or may be such as have borne office in the warres, and yet discontinue so long, as they have forgotten their trade, or that the fashion of the Warres and exercising bee

changed, since hee was last a Souldiour, that every Muster-master, shall not only at his first entrance, bee approved by such as are able to judge him, to bee fit for that charge, but to the end he may continue so, hee bee injoyned once, in 4 or 5 years, to goe personally for the Sommer time into some actuall Warre abroad, if any bee, to retaine and renew his knowledge, that the Captains of the Trained bands, bee injoyned themselves to passe the Seas, to learne the duties of their places, or at least, to keepe of his owne charge, one that can discharge his place, and if neither to quite their commands to such, as will doe the one or other.

By this means his Majesty may have an Army of foot on a sodaine in any part of England to answer all occasions, without drawing his forces much farree out of their proper countries; for an Enemy may make shew of landing in one place, and having drawen the greatest strength of the Kingdome thither (windes serving for it) sodainly transport himself to another, before that Army can by land come there.

Now for horse, wherein this Kingdome is more defective, then I think is any other, it were a worke worthy of his Majesty, seriously to take into consideration, how to amend it, and though on a sodaine, it is not to bee hoped to bring the work to any great perfection, yet a good foundation once well layed, in processe of time, it may be effected, and for the present bee much helped; it is so great a worke, and my experience being not so much that way as in foote, I will not take upon me to deliver any certain grounds for it, but will only point at some wayes, whereby I conceive it may bee reformed. The defects consists chiefely in want of fit horses and fit men to bee horse-men, which I take to bee the greater want of the two, and can but wonder, that so great a Kingdome should be so defective in so brave and noble a strength, wherein our nearest neighbours so abound, in ancient times we were not so, it may bee one reason is, that now our Nation is more addicted to running and hunting horses, then in those elder times.

For remedy, under correction, First, that there where care taken, that there were a stronger breed of horses through the Kingdome; then that his Majestie would beginne at his Court and there convert his bands of Pensioners into a brave troupe of Curassers, there horses at least so ready, as to give and change a pistoll on, Sometimes to exercise them, by shooting at a marke on horseback with their pistols, and always to keepe this band so. To admit none to those places, but such as before, were knowen to bee horsemen and could use pistoll on horseback: Then that the Lords, and others of his Majesties great officers, and Councill, did follow this example, and every-one to keep sound great horses, to have Armes, and pistols, and some such Servants as were fit to bee horsemen, and to induce other Lords, and Gentlemen of great estates, to do like, and

incourage them thereto; to reserve all personall honours (except experienced Souldiers that had born good Command) for such Noblemen and Gentlemen as did in this conforme themselves to doe His Majesty and Countrey service, whereby those, which never intend to make the Warres their trade, might bee brought so faree as to be enabled to doe something for the defence of their King and Countrey; if the Noblemen and Gentlemen would take this to heart, as they have done, running on races for bels (which I could wish were converted to shooting at a marke with pistols on horseback for the same bell), they would bee sufficient for Curassiers.

Now, for other kinds of horse, I would that the trained bands were increased and all reformed to Harquebusiers, but whether their Peeces to bee with Firelocks or Snaphaunces, is questionable; the Firelock is more certain for giving fire, the other more facile for use. For the present my opinion is, at first, it were best to take up the Snaphaunce, untill Pistolls be more frequent, which being more difficult to use, are fittest as before fore Gentlemen to begin first to bring into use: When they have once brought them to be ordinary, it will be more facile to bring them into use amongst the inferior sort, and for the present, this Kingdome hath not (except in London and it may bee some few towens besides) Artificers that can make or amend fire locks: Then I would have a mustermaster apart, for the horse, as well as for the foote, well chosen, some old Horseman out of the Low Countries; For that it is scarce possible to find men that are fit and able for both horse and foote: The Kingdome thus armed and exercised an enemy cannot land in any part of it, but, (without unfurnishing the other parts) there will bee a competent Army presently found to make resistance.

It may bee said, these advises will bee found not practiquable, or very difficult, so are all great workes at first, but I conceive, if his Majesty would take it to heart, and give incouragements of honour and preferrements, to such as conformed themselves to his pleasure herein, and make this the way of advancement, it would not bee difficult, but if without this way honour and advancement may bee had; well may they thinke, why should they take such pain, or be at such charge, for that which may more easily bee had: And here I cannot but blame our Nation in the general, (for I believe, the most gloriousest of our neighbours, will grant, it as valiant a Nation as is on the earth) that they should not bee more addicted to Armes, but give themselves for the most, to expensefull pleasures, altogether unserviceable for King and Countrey: whereas there is not a French Gentleman, that so soon as hee begins to write man, but learnes to ride, to use his armes on foot and horseback, and whether younger or elder brother, puts himself into some actual warre for sometime, to learne the trade of a Souldier though he never intend to make it his profession. I would

further advise, that all the principol Harbours and good landing places were so fortified, as farre as is possible, that no Enemies Fleet should anchour in them or much lesse land in them, with out remarkable disadvantage. The Command of which places I would have given to none but experienced souldiers, and such as are found in Religion, and had borne commands in the warres for many yeares, and they to reside in them: not unto noblemen, or gentlemen of great estates, which seldome, or never, come at them, and much lesse to meaner men than are no souldiers: for maintenance whereof the charge once arrested, to repartite them on some revenue neere enjoying, and being well paid, to have strict oversight had, that there bee alwayes such, and so many able Gunners and Souldiers present in them, as his Majesty payes on all occasions to bee used; if lesse will serve then why should his Majesty bee charged to pay more.

To Conclude, if his Majesty would reserve the places properly belonging to the warres, (whereof hee hath the fewest of any great Prince of Christendome) as, the Governments of his Ilands, the keepers of the Forts, and Castles, and places of command in Zeeland, only for souldiers, and worthy souldiers, and men found in Religion. It would be a great encouragement to his Subjects to follow the warres, to enable themselves to do him service, though to their cost and charge, when they have to hope, that though they serve a strange Prince, or State to their no advantage, yet thereby inabling themselves to doe their owne King service, they may in time bee provided for in their owne countrey; whereas if charges and commands, advancements of honour may bee had better cheape, by staying at home and following their pleasures, there will but few ever take the paines and labour, or bee at the charges to inable themselves by following the warres abroad, all men being led, either by honour, or profit, or both.

THE STRATEGICAL ASPECTS OF ENGLISH CASTLES.

By W. H. St. JOHN HOPE, Esq., M.A., Director of the Royal Archæological Institute.

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UNTIL within the last few years the whole story of the genesis and purpose of English castles has been in a state of tangle. This was chiefly on account of the confusion that has existed as to the possible dates of the various classes of earth works with which England abounds, and in particular of those which are so often associated with our castles.

But in 1901 an active Committee, appointed by the Congress of Archæological Societies "to prepare a scheme for a systematic record of ancient defensive earthworks and fortified enclosures," set to work, and was able to draw up and publish, for the first time, a reasonable classification of our earthworks that has happily been generally accepted by antiquaries.

It is accordingly now possible to give a fairly definite date to a particular class of earthwork which forms the basis of a very large and important group of English castles.

Such works consist for the most part of a large or fair-sized conical flat-topped mount, surrounded by the ditch out of which it was thrown up, and accompanied by one or sometimes more attached courts or baileys, protected by lines of bank and ditch. The general plan, of course, depends upon the configuration of the site, and it has been not unusual to take advantage of any natural rise or hill in the formation of the mount, or of cliffs, ravines, or steep banks, as defences of the baileys. The average size varies from 3 to 5 acres.

Upon the mount was set a wooden tower or citadel, approached by a flight of steps, and encircled by a defensive platform of timberwork, and the banks were crested by wooden palisades, like walls of railway sleepers, until such time as mount and banks had settled sufficiently to carry walls of unburnable masonry. Graphic pictures of the Norman castles of this type at Dol, Rennes, and Bayeux, are shown in the

Bayeux Stitchwork, and in a fourth example, at Dinan, the inflammable character of the tower is shown by the efforts of men who are trying to fire it.

The only part of the defences which was of stonework was the gatehouse, because it could be built from the first on solid ground, in a gap left for it in the line of earthwork. Good early examples remain at Exeter, Lewes, Tickhill, and Arundel. The palisades right and left of the gatehouse, and those cresting the mounds enclosing the bailey or baileys, were continued across the ditch and up the mount to the tower on top, and so formed with it one continuous ring of defence.

As soon as the earthworks had settled enough to bear their weight, it was usual to replace the lines of palisading by walls of masonry, often with towers at intervals, and the wooden tower on the mount gave place to one of stone. This was generally a ring of walling with interior buildings against it, following the lines of the former wooden defences; but occasionally, Norwich being a notable example, a massive stone tower was raised upon the mount. An excellent illustration, in which the earthworks are strengthened throughout by masonry in place of earlier timber defences, is afforded by Hollar's bird's-eye view of the Royal castle of Windsor.

There was not, of course, from the first, any difficulty in setting up stone buildings within the baileys of these castles, like William FitzOsbern's great hall at Chepstow, or Scolland's hall at Richmond, or the equally early chapels at Oxford and Durham.

In a few cases, when the natural strength of the position rendered earthworks unnecessary, or the castle was founded upon rock, it was walled from the beginning, as at Exeter, Richmond, Corfe, Ludlow, and the Castle of the Peak.

But as a rule the timber defences were general, and in many cases they can be shown to have continued well into the thirteenth century. The lower bailey of the King's own castle of Windsor was not walled until 1227, and yet was able to resist successfuly for three months the siege by the Barons and their French allies in 1215.

The ditches or fosses that surrounded these castles were, of course, of a magnitude corresponding to the banks and mounts that were dug out of them, hence the bigger the mount or bank the deeper the ditch. In some few cases, as at Hedingham, Basing, and Old Sarum, the site of the citadel was so large that the material thrown up sufficed only to form a bank round a raised central area within, in which was later built a tower of masonry. The ditches were, of course, in themselves a material addition to the defences, and were spanned by wooden bridges before the gates, which could be lifted or removed in time of need.

There is no reason for supposing that these ditches were made or meant to hold water. By far the greater number were always dry, and when water was admitted purposely, as in the case of the pool encircling the castle of Berkhamstead, it was only because the natural conditions were favourable. The primary reason for the formation of a ditch was, that it yielded the material for the construction of bank or mount.

It may, perhaps, here be pointed out that it is essential to remember what is meant by the word "castle." This, of course, refers to the entire fortress or stronghold, and not to the chief feature within it, whether mount or tower. People constantly talk of "Rochester Castle" as meaning Archbishop William's great tower, or, with more excuse, of "Colchester Castle," which now consists of the great tower only. Such a mistake is pardonable, perhaps, when the tower, as at London, gives its name to the whole fortress. But on the other hand, Windsor Castle (for example) is always spoken of correctly with reference to the whole, without meaning "the round tower," which is its dominant feature. A castle, then, is the complete fortified enclosure, and it may include a *mota*, "motte," or mount, as at Southampton, Carisbrooke, or Norwich, crowned with a stronghold polygonal or circular in plan, or built tower-wise; or, instead of such a mount, a *turris*, donjon, or great tower, as at Colchester, London, Porchester, Pembroke, etc.

Many a castle, no doubt, originated in the throwing up of the mount, so that it might settle sufficiently to carry its defences, and never got beyond such initial stage. It is possible that some of these incomplete castles, which consist of a mount only, may have been in course of construction when all further castle-building was forbidden by King Stephen.

Castles based on earthworks of the type described, and with existing added defences in masonry, or traces of such, are to be found throughout the length and breadth of England, and there cannot be any reasonable doubt that they were placed where they stand at one particular period, by a single dominant power, and in conformity with a definite and rational plan.

Examples are to be found at Norham on the Tweed, Newcastle on the Tyne, Durham, York (where there are two), Clitheroe, and Penwortham in the north. At Launceston, Okehampton, Exeter, Corfe, Winchester, Carisbrooke, Arundel, Lewes, Tonbridge, Rochester, Canterbury, and Dover in the south. From Lincoln, Cambridge, Castleacre, Norwich, Thetford, Bungay, Colchester, and Rayleigh in the east, to Rhuddlan, Chester, Shrewsbury, Wigmore, Hereford, Clifford, and Cardiff in the west.

Now, at what period in the history of Britain was the whole land from the Tweed to the Solent, and from the North Sea and the Straits of Dover to the marches of Wales in the hands

of one dominant power? No one at any time has claimed as Roman the sites of these castles, and there can, therefore, be but one answer. Not until the great fight in 1066 at the place we call Battle, which made the conquest of England possible to the victorious Norman Duke William. And who but he and his lords and their sub-tenants could have thrown up these castles all over the land?

Both the fact and the purpose can fortunately be proved by historical evidence.

The word "castel" is first mentioned in the Anglo-Saxon Chronicle under the year 1048.

> "Then had the Welshmen wrought a castle in Herefordshire among Earl Swegen's followers, and wrought every harm and insult to the King's men thereabout that they could;"

and the surrender of this castle and of the Frenchmen (or Normans) who were in it was among the things demanded by Earl Godwin in 1052. It will be noticed that both word and thing were new.

On Godwin's return from banishment the same Chronicle states that Archbishop Robert and the Frenchmen who had caused discord between the Earl and the King

> "took their horses and went, some west to Pentecost's Castle, some north to Robert's Castle."

Pentecost's castle in the west was that at Ewias Harold, and probably, therefore, the Herefordshire castle mentioned in 1048. The castle to the north, that is of London, was apparently that of Robert, son of Wimarc, at Clavering, in Essex. These and maybe some few other early examples were in all probability the work of Norman favourites of King Edward the Confessor.

The only other castle mentioned in the Chronicle, the "castel aet Haestinga Port," said to have been wrought by Duke William himself on his landing in England, is actually depicted in course of construction in the Bayeux Stitchwork, with the inscription

ISTE IVSSIT VT FODERETVR CASTELLVM AT HÆSTENGA CEASTRA.

The few castles that had previously been built, such as Ewias Harold and Clavering, were certainly not numerous, for Orderic, in describing the general insurrection of 1068 on the Welsh marches and in Northumbria, says that

> "the fortresses which the French call castles have been very few in the English provinces, and on this account the English, although they were warlike and bold, were notwithstanding too feeble to resist their foes."

William of Jumièges ascribes the establishment of castles as originating with King William himself, who, he says,

> "guided by the prudence which he knew how to be mindful of in everything pertaining to a King, visited with extreme care the least fortified parts of his kingdom, and to repulse the attacks of enemies established very strong castles in suitable positions, which he fortified with the best of his soldiers and plenty of pay."

This systematic building of castles was begun by William directly after his coronation, when, as Orderic tells us, he quitted London for a few days and abode at Barking "while certain strongholds (*quaedam firmamenta*) were being raised within the City of London." These strongholds were clearly the Baynard's Castle and the Tower of London of later days, and were placed one at either end of the City, on the bank of the Thames, "against the movement of a large and fierce people," says Orderic.

Early in 1067 the King made the progress through parts of his kingdom referred to by William of Jumièges. He also built, according to Orderic, "a strong citadel" within the walls of Winchester and committed it to the care of William Fitz-Osbern, whom he had made Earl of Hereford. The castle of Dover was entrusted to the King's half-brother, Odo, Bishop of Bayeux, who was made Earl of Kent.

About the same time King William went oversea to Normandy, and the Chronicle laments how his regents

> "Odo the Bishop and William the Earl remained here behind and wrought castles widely throughout the nation and oppressed poor folk; and ever after that it grew greatly in evil."

These castles, therefore, were new things, and offensive and defensive works distinct from a town; they were also the strongholds of individuals and not of communities.

On William's return from Normandy in 1067 his first act was to march against Exeter, where, having captured the city and suppressed the rebellion there, "he chose a place within the walls for rearing a castle," which is still noteworthy for its early Saxon-looking gatehouse. While the Exeter castle was in building the King continued his march into Cornwall, and so completed the subjugation of the west country. The castles of Launceston, Trematon, and Okehampton probably date from this visit.

Early in 1068, while on his way to York to crush another rising of the English, King William raised castles at Warwick and Nottingham, and following the surrender of York he "built a fortress in the city itself, which he delivered to picked knights to guard." On his way south Orderic says that the King built castles at Lincoln, Huntingdon, and Cambridge.

In 1069 the castle at York being besieged during a second rising, the King promptly marched to its rescue, and having raised the siege, stayed eight days in the city while a second castle was wrought there. The mounts of both castles exist: the one as the base of the later structure known as Clifford's Tower; the other, which faces it across the Ouse, being the lesser known Bail Hill.

Later in the year the English of the North again rose in rebellion, and, aided by the Danes once more attacked York and demolished the castles, probably by burning their wooden defences. King William for the second time relieved the place, and leaving there a strong force to restore the castles, laid waste the whole country from the Humber to the Tweed. Orderic says that "his castles were scattered over a space of 100 miles," from which we may infer that strong fortresses were left to ensure good order for the future.

On his return William set out for Chester to crush another rising, and built a castle in Chester itself and another at Stafford on his way southwards.

The Abingdon Chronicle also states that at the beginning of William's reign castles were built at Wallingford and Oxford and Windsor and other places "for keeping the kingdom."

The historical statements just quoted are fully confirmed by the Domesday Survey, which, although it says nothing about many that were certainly in existence, refers directly or indirectly to some fifty English and Welsh castles, and in many cases in terms that show they were new. Thus houses are noted as having been destroyed for the sites of castles at Wallingford, Cambridge, Gloucester, Huntingdon and Lincoln; in this last case to the large number of 166. And at Stamford and Warwick certain houses had become "waste" on account of the castle.

In the manor of Kingston, County Dorset, the King had a hide of land "on which he built the castle of Warham," better known to us as the mighty stronghold of Corfe; and at Rockingham land worth 26s. was waste "when King William ordered a castle to be built there." At Stafford there was a piece of land in the manor of Chebsey "on which the King ordered a castle to be built, which now has been destroyed," adds the Survey, probably by burning or dismantling its wooden defences, since the mount and its bailey still exist. The castles of Windsor and Carisbrooke are also described in terms that imply they were new.

Of other castles held by the King *in capite*, the Survey says that Earl Roger "constructed the castle called Muntgumeri," and that at Oswestry, under Earl Roger, "Rainald has made there the castle Luvre," that is "the work." At Rhuddlan, in Flintshire, a sub-tenant of Hugh earl of Chester, had "made anew in the manor of Roeland a castle likewise called Roelent." On his manor of Rayleigh, in Essex, "Suen has made his

castle;" and the Suffolk Survey states that William Malet "has made his castle at Eye." On the land of Roger of Poitou, between the Ribble and the Mersey, where King Edward held Penwortham (opposite Preston), "there is now a castle."

With five castles within his own earldom the name of William FitzOsbern is associated, and since he died abroad in 1072 they can be approximately dated. These are Clifford, which Earl William built on waste land; the castle of Estrighoiel or Chepstow; Berkeley, in the manor of Ness; Wigmore, built on waste land called Merestun; and Ewias Harold, which the Survey specially particularizes as having been "rebuilt" by the earl "*qui hoc castellum refirmaverat.*" This probably refers to a renewal of the timber defences which had, perhaps, been burnt by the Welsh.

Lastly, there is a complaint of the English burghers of Shrewsbury that they are still called upon to pay taxes as in King Edward's days, "although the earl's castle has occupied 51 houses and another 50 are waste;" the said houses, having obviously been displaced for the site of the mount and bailey castle which still remains there. This castle of Shrewsbury was in existence as early as 1069, when Orderic calls it *præsidium regis*, or the King's stronghold.

Besides the castles already mentioned by contemporary writers or in the Domesday Survey, there are many more important examples which, from their character and position, must be assigned to the same time and be looked upon as forming part of the same great offensive and defensive scheme.

Many of these are mentioned in the Survey, including the royal castles of Monmouth, Canterbury, and Norwich; Launceston and Trematon, in Cornwall; Okehampton, in Devon; Dunster and Montacute, in Somerset; the castle of the Peak, "Pechesers," in Derbyshire; Rochester, in Kent; Caerleon, in Monmouthshire; Richard's Castle, in Shropshire; Arundel, Hastings, Lewes, and Bramber, all in Sussex; Dudley, in Worcestershire; and the Yorkshire examples of Ilbert's castle at Pontefract, Earl Alan's at Richmond, and Earl Roger's castle at Clitheroe (now in Lancashire). The Survey also mentions the castle of Helgot, an under-tenant of Earl Roger of Montgomery, at Stanton, Salop, now Stanton Holgate, where its mount may still be seen.

There are likewise historical or other reasons for including among the castles raised during the reign of the Conqueror or his successor the royal fortresses of Newcastle-on-the-Tyne, Durham, Worcester, Hereford, Dover, Guildford, Hertford, Southampton, Berkhamstead, Oxford, Old Sarum, and perhaps Bristol; also Devizes, Tickhill, Tamworth, Thetford, Bungay, Clare, Ongar, Pleshy, Hinckley, Belvoir, Leicester, Reigate,

Tonbridge, Sandal, Castleacre, Basing, Norham, Alnwick, Warkworth, Thorold's Mount at Peterborough, and the mighty tower of Colchester.

From a map which I have prepared and is here exhibited it is possible to see how effectually the distribution of these castles all over the country accomplished the conquest of England.

With some few exceptions, a castle was established in every county town, and often supplemented by two or three others in the county itself, where the necessity for them arose. They thus dominate and overawe the towns themselves, while at the same time controlling the roads and waterways. They watch the passes through the hill ranges and mountains, as may be seen by the castles of Lewes and Bramber and Arundel, with their rearguards at Reigate and Guildford and Windsor, and the line along the Welsh border of Rhuddlan, Oswestry, Montgomery, Wigmore, Clifford, Ewias Harold, Caerleon, and Cardiff, with the second line that includes Chester, Shrewsbury, Stanton Holgate, Richard's Castle, Hereford, Monmouth, and Chepstow. They command estuaries and landing-places, and Orderic expressly says that Pevensey and Hastings served at Norman William's first landing as bases for his army and havens for his ships. The turbulent Londoners were kept in check, like the men of York, by the two strongholds within the City, and also by an outlying ring of castles which includes Rochester, Tonbridge, Reigate, Guildford, Windsor, Berkhamstead, Hertford, Ongar, and Rayleigh.

There are, on the other hand, certain districts where these early castles are entirely absent, or but few and far between. None is to be looked for in Cumberland and Westmorland, since these counties then formed part of the Scottish province of Strathclyde. In Lincolnshire, Nottinghamshire, and East Anglia there are very few, apparently because the dense Danish population of those districts was never really subjugated. There is also a curious lack of castles in the district between the Cotswolds and the Chilterns, which is difficult to account for, unless we may suppose it to have been so thinly populated as not to be looked upon as formidable.

After the completion of the Conquest of England and the restoration of order, many castles ceased to be of strategical importance, and were no doubt dismantled and abandoned; while others, which had been planned on a large scale, were reduced in size. Interesting examples of this occur at Carisbrooke and Rockingham, where a large outer bailey has been omitted when the timber defences were replaced by masonry.

The internal troubles of King Henry II.'s reign seem, on the other hand, to have caused a number of castles to be repaired or strengthened, and the Pipe Rolls of the time show that

keeps or great towers were added at Orford (1165-7), Bridgnorth (1168-9), Bowes (1170-3), Chilham (1170-3), Hertford (1170-3), Hastings (1171-4), Richmond (1171-2), and Newcastle-on-Tyne (1171-7), Canterbury (1172-4), Oxford (1172-3), the Castle of the Peak (1175-6), Tickhill (a ten-sided tower on the mount, 1178-80), Northampton (1181-3), and Dover (1181-88). Of these it is interesting to note that Newcastle and Dover were the work of the same architect, as we should call him, who is in the one case called Maurice the mason, and in the other Maurice the *ingeniator* or engineer. Ralph the mason was the builder of Chilham. The huge tower of Norwich is also a work of Henry II.'s reign, and it, and the contemporary tower at Castle Rising, are the work of one architect. The earlier towers of Rochester (which was built between 1123 and 1135) and Hedingham must also have been designed by the same man, and it is interesting to see how in the Kentish example he dealt with Caen stone and Kentish rag, and in the Essex tower with concrete faced with Barnack ashlar. There cannot also be any doubt that the enormous tower of Colchester, built in the closing years of William the Conqueror, was planned by the same engineer who built the Tower of London under Bishop Gundulf for William Rufus. These two great towers, it may be remarked in passing, are the earliest of their types in this country, and it would be interesting to know of any proved older examples in Normandy which could have suggested them.

Time will not permit me to do more than refer briefly to one or two other groups of castles, of more or less local character.

The most noteworthy of these is the fine series, of an entirely new type, which includes Harlech, Carnarvon, Beaumaris, and Conway, Criccieth, Rhuddlan, and Flint, built by King Edward I. to keep in order the Welshmen, whom he had conquered but not subdued.

These are of interest as being almost the last castles proper that were raised in this country; changes in methods of warfare, the introduction of artillery, and last, but not least, the final peaceful settlement of the whole of England and Wales, making it unnecessary to build more.

One other group may also be mentioned, though strictly speaking they are not castles at all, but defensible houses composed of ranges of chambers and towers built about a courtyard, which, therefore, combine the element of the foregoing strongholds. They include Bolton in Wensleydale, one-half of which was contracted for in 1378; Sheriff Hutton (1381) and Wressle, both in Yorks; and Bodiam in Sussex (1385); also Middleham, which encloses a fine Norman great tower; and Lumley, the latest of the series, begun after 1389. These were, of course, private houses and not the property of the King.

Such later attempts as the line of forts built by King Henry VIII., along the south-east coast, from Deal to Hurst Castle, against a threatened French invasion, and the still more recent series of martello towers dotted along much the same line in preparation for Napoleon's boasted visit, can hardly be regarded as England's castles, and are more closely paralleled by the blockhouses devised by Lord Kitchener during the Boer War.

T. Miller Maguire, M.A., L.L.D., Barrister-at-Law (Inner Temple): Sir, it is a pity there should not be any discussion on this interesting paper, from which I have received an enormous amount of instruction in a very short space of time. I will, therefore, endeavour to make a few remarks while the other members of the audience are thinking of what they will say when I have finished. I was glad to find that somebody could keep the Welshmen in order, and that accordingly a very considerable number of castles were constructed with that view. I wish the learned lecturer would tell us whether there is any modern device which will bring about the same noteworthy and highly desirable result! For myself I have recently been spending some time in Yorkshire, and I take it that the strength and importance of the castles there were not merely with the object of keeping in order the Saxon enemy of the Norman. Perhaps the learned lecturer will be able to tell us that they were also designed against the Celtic fringe, which, at the present moment, is very troublesome from the West. Was not York Castle intended to break the waves of the surging northerns in their various excursions southwards? Though it is a mistake to suppose that either the hostile leaders or the fighting men in the numerous Scotch wars from 1290-1556 were Celts, they were of the same breed as the Anglo-Normans of old Northumbria. There is another castle which the lecturer did not mention, which it seemed to me when I was in Yorkshire was extremely interesting. It seemed to be old, although I had not much time to study it. It had a splendid keep, with a most formidable dungeon, and all kinds of apparatus for cooling the ardour of invaders at very great depths—I refer to Skipton Castle. I do not know whether the lecturer knows anything particular about it. With regard to the strategical placing of the castles, it seems very strange how history repeats itself, because there have been divers plans made by ingenious territorial commanders recently with regard to the defence of England at different centres, and these correspond almost exactly with the ideals of the mediaeval and Tudor periods. There has been a notion abroad that the resources of the country might be used by putting our trust in a new type of Martello towers. I do not know whether you, Sir, have much regard for Martello towers. I was brought up as a child in the neighbourhood of several of them, and we used to have the highest possible respect for the chief of the castle, generally a sergeant of the Marine Artillery His proceedings struck awe into our hearts, but we never rgarded him as anything very much in the way of a military hero. My opinion about the Martello towers is that they were the most egregious misconception possible, as are modern ideas about the multiplication of coast defences. I think they were made by an Italian, and I do not think that Napoleon would have attached the slightest importance to them had he stuck to the invasion from

Boulogne, and not turned his Grand Army to the Rhine and Danube against Austria. They cost about two millions of money, and a more useless waste of money could scarcely be conceived. But the curious thing is that the defensive strategists of 1800-1805 were not satisfied with the sea ditch in front of our isle. One would have imagined that the sea was a considerable ditch, and that if Napoleon could have brought his troops across that ditch it would serve little purpose to put another ditch behind the castles! If the learned lecturer in his reply will explain how it was that the Kentish ditch was made behind the Martello towers I would be obliged to him, because I have never been able to understand the use of that canal or ditch. But to revert to the question of the practical repetition of history in regard to the Territorial forces. The idea of some ingenious engineer was that we should again have at places like Hull, a rather important port, a big castle or series of fortifications, and that we should have castles or works at Colchester, at Southend, up the Severn, near Bristol, and so forth, and that then we should connect these castles and works with a lot of castles in the centre of England. Going over these supposed defences, I find that every one of them is the site of one of the castles of either the Conquerer, Henry II. or Edward I., for obvious reasons, just the same, I suppose, that our great modern roads take the route of the Roman roads, and the modern thoroughfares of France are very near the mediaeval ones, notwithstanding the introduction of railways and similar modern devices. I wonder why the learned lecturer in the course of his most interesting and instructive discourse left out one part of the kingdom altogether. He referred, I think, neither directly nor indirectly to any of the castles of Ireland, and yet surely the Irish required castles fully as much as the Welsh, and even now perhaps require castles up to the standard of the Welsh. I think there were some very good castles in Ireland. I know one castle where some of us spent a great deal of our time with much profit—Blarney Castle, just outside Cork. I should be much obliged if the lecturer will tell me the exact cause of the peculiar location of the particular stone in the front of that castle, because I have no doubt its careful study and a visit to the spot would produce a stimulating effect, not only on the soldiers here present, but also on the ladies who accompany them. There is not much more to be said from my point of view on castles, but I see everyone would like to obtain some information with regard to the mystery of the stone on the wall of Blarney Castle. There is a very remarkable book on English Castles which many of us students learned "Mediaeval Military Architecture." I do not know whether the learned Chairman knows it, and I forget its name just now, but it was very much in demand when I was a student, and it is of an instructive and edifyingcharacter, though I fear not up to date from the point of modern research. But for my own part, not being very skilled in archaeology, I can do no more than ask these very moderate and not recondite questions, which I hope the learned gentleman will answer, and congratulate him on his most interesting, instructive, and suggestive lecture on the Keeps wherein brave Knights kept watch and ward of olden time, and gave security and hope to the fair dames and hard toilers of their neighbourhood.

MAJOR C. B. SIMONDS, R.G.A.: I must ask you to forgive me, Sir, if I make a few disjointed remarks on this very interesting subject, but at the present moment it opens up a very absorbing question to officers in my

branch of the service. I have just returned from India. Lord Kitchener's redistribution of troops called for several modifications in what we now call in India the internal defence, and from an Imperial point of view it seems to me the subject wants to be carefully studied in other parts of the Empire than in India alone. In India there are many castles and fortresses which have been built by native chiefs at very important strategical points. I think Dr. Miller Maguire said on one occasion that the laws of strategy are eternal. It seems to me that this really bears out that saying, because these fortresses in India, which are now occupied and kept up, are at very important points. Engineering has done a tremendous amount of work in the way of making railways and canals, which have made almost any threatened area in any part of the country accessible. But the best engineering feat is always liable to be destroyed, whether it is a canal or whether it is a railway, but you cannot blow up a river. A natural feature is a thing which it is not easy to destroy; and in the event of any big disturbance, or even attack from an outside enemy, the question of internal defence seems to run on practically the same old (strategic) lines. As regards the tactical arrangements, of course modifications are required, but the main rivers and big waterways of India fortunately are commanded by fortresses built 300 or 400 years ago by Mogul Emperors, such as Akbar. The question of the defence or the bringing up-to-date of a lot of these defences is a very broad subject to go into. Curiously enough they hardly want altering in position at all. There are other questions besides the actual defence, and the archaeological point of view that seem to me of importance. We have to consider a good deal the question of the religious ideas of the natives. One particular fort I may mention, in India, in connection with that subject is Allahabad. It is a very curious fact that Akbar, a Mussulman, should have guarded the interests of the people to such an extent that he allowed a sacred Hindu shrine to remain in the fort which he built all round it. It is a place which millions of pilgrims visit during the year at big native festivals, and once every twelve years an extra large number visit it. So long as we safeguard the interests of the people in that way, and look after their old fortresses, and also their relics and guard them, it does a great deal towards keeping down any chance of a rising. These are points that are being kept in view in India at the present time. It is a subject very analogous to that which has been dealt with to-day, and in other parts of the Empire we can also very easily draw a line from the paper that has been read to us. I had not the opportunity of seeing a copy of the lecture before it was delivered, otherwise I might have had time to put what I have said to-day into a less scattered form.

The CHAIRMAN (Professor Oman): There are one or two general points that suggest themselves to me. The first is that with regard to English castles at large we must make a division that was suggested by the lecturer although I do not think he put that division into actual words. There is an enormous difference between the meaning and importance of the Royal castles and the meaning and importance of the private castles. The King's castles clearly are for one of two main purposes. Many are purely strategical, that is to say, they are either to guard a great passage of a river (as at Wallingford, or Pontefract, or Newark), or they are to guard an obvious and easy entry into the kingdom by some great seaport, like

the fortresses at Dover or Porchester. That is the purely strategical kind of castle. Or, secondarily, there is the castle which is built to keep a large and turbulent town under subjection, like the Tower of London, the Castle at York, and many other castles dominating big country towns like Colchester or Lincoln. Those two sorts of castles clearly are the classes that the King has to build. But the object of the great private castles differs entirely from this; that is to say, the baronial castles usually have no strategic purpose, because the baron is necessarily a local person. He is interested in the defences of his own estates, and also in the defence of his own person. His estates, according to the great system devised by William the Conqueror, under which he refused to give any of the Norman barons too much land in any one region, were diffused all over England. There was hardly a shire in which there was a complete predominance of one great baronial family, although there were a few like Shropshire and Cheshire. But as a rule the Earl or Baron had his land scattered all over England, and had not one district wholly at his command, so that he does not want what we may call a strategical castle What he wants is a tactical castle, that is to say, a castle from which he can dominate his surrounding estate, or in which he can shut himself up to resist any assailant, either the forces of his overlord the King, or on other occasions, it may be, the foes of the realm—but generally his overlord. Therefore the main object of the baronial castle will be to seek for pure local strength. We need not expect to find them as a rule on great highways, nor at great ports, nor at the greatest fords, but the baron, as a rule, will look for the strongest position that he can get on his estates, and make there the strongest castle possible for the mere purpose of defence. Many of the greatest and most important castles of England that were baronial, are singularly remote from the highways. For example, Berkeley Castle does not command, as it might have done, the way from Gloucester to Bristol, though it was the one first-class fortress of Gloucestershire. It is put in a corner between the great Roman road from Bath to Gloucester and the sea, where it does not command anything in particular. So, too, with many of the other of the greatest baronial castles. For example, Hedingham, the great stronghold of the De Veres, in north Essex, covers nothing save the surrounding district. Such castles aim at nothing more than local defence, which is a very different thing from the King's wish to dominate a great town, or to protect a port, or to cover a great highway where it crosses a river. There is only one part of the realm in which the baronial castles are in a way strategic, and that is in one part where the barons were formed into a sort of community or organisation, I mean the Marches-Lords of Wales, who stuck together and co-operated against the wild tribes of the "Celtic fringe." The baronial castles of Wales do, of course, support each other. When one man went to cut out for himself a territory from the independent Welsh, he had to base himself on the hold which his predccessors had already made in regions nearer England, and the very elaborate inter-dependence of the castles of Herefordshire and Monmouthshire on the one side, and Glamorganshire and Brecknockshire on the other, does suggest a very deliberate strategical arrangement. But as a rule throughout England you may say that the King's castles may be strategic, and often are, but the baronial castles will not be, because the Barons are seeking the purely personal and local end of defence. That is the first main thesis

that is borne in upon one listening to this very interesting lecture. My second point is mainly one great query for Mr. St. John Hope to answer. Fifteen years ago I thought I knew something about English castles. I had seen a great many of them, and I had digested that excellent book (as we thought it in those days) "Clarke's "Military Architecture of the Middle Ages," which I think was the work of which Dr. Miller Maguire spoke. I have studied a great many of the castles he has alluded to pretty carefuly. But now a new generation has arisen, which knows not Clarke. Within the last few years, as nobody knows better than Mr. St. John Hope, the Society of Antiquaries has been pervaded with a new school, which refuses to acknowledge the simplest of Mr. Clarke's original theories, particularly the theory which is the basis of all his opinions, namely, that the normal Anglo-Saxon fortress was a mount by a river, stockaded round and round by palisading, with more or less outer defences, also surrounded by palisading and ditches; that what the Normans did was to substitute for the palisading and the plain mount "shell-keeps" as they were called and donjon towers—shell-keeps meaning rings of walls put round the mount, and donjon towers meaning square-built blocks like the Tower of London, put either in the middle, or, as a gate tower, at one side of the whole structure. I believe the theory of the difference between the Saxon and the Norman castle is being called entirely into question by a school of Archaeologists of which Mr. Round is the leader. I have not myself had the privilege of being present at the meetings of the Society of Antiquaries when these things were discussed, and I am going to ask Mr. St. John Hope to explain to us what impression was made on his mind by this attack on what we used to consider the Palladium or the Ark of the Covenant of military castle building, viz., the main theory of Clarke's Military Architecture of the Middle Ages. If we refuse Mr. Clarke's theory we are driven to this point. We know that the Anglo-Saxons built, from the most clearly strategical points of view, fortresses all over England; Alfred and his son, Edward the Elder, pushed across from the South and the West towards the North and East of England. They built one after another, row after row of fortresses, by which the captured Danish towns were dominated, and by which whole districts were held down. These strongholds were then called Burhs. Are we to believe no longer that the stockaded mount by the water-side, which we so frequently find, is the remains of the Saxon Burh, and that the masonry building, either of the donjon, or shell-keep style, which we often find superimposed on top of the earlier work, is the Norman improvement on it? Then I should like Mr. Hope to tell us what I forgot to ask him before, what exactly he thinks that the Burh was. I can imagine some people saying that the Saxon fortress was rather a garrison than a stronghold. We are always told in the Anglo-Saxon chronicle that King Edward builds a "burh" and sets "burh-wara" therein, that is to say, a garrison within it, and that they defend themselves. Is it possible that the differentiating thing that made a Saxon Burh was rather its military settlers than the character of its works? Might the fortification differ indefinitely in type between one place and another? Those are the two main points that I have to raise. One of them is a thesis, the other a mere query for information.

There are one or two smaller points that may perhaps be worth mentioning that struck me while I was listening to the lecture. In some of

the castles that Mr. Hope mentioned, where the outer wall or rampart of a Norman castle was incomplete, where only part of the place was defended on account of its largeness, it struck me that the cause might be in some cases simply the character of the soil. Where you have deep earth to dig, it is easy to make big defences, but where you only have four or five inches of soil on the top of rock or chalk, it is clearly more difficult to build outer earthworks than it is in a place where you are dealing with clay or loam. Another point that struck me was the curious fact emphasised by the lecturer of there being some districts of England where there are much fewer castles than one would expect. For example, there are none between Gloucester and Warwick on one side of the triangle, and Oxford and Wallingford on the other two sides of it, and similarly there are very few in certain other parts of England. My own suggestion would be that, as a rule, this want of castles means want of great barons. In the central parts of England the king only required a very limited number of castles; and you know that the different counties of England were differently divided up between the landowners. In some places there were large estates, and in others there were a great number of smaller barons. It is particularly in counties like Oxfordshire and Buckinghamshire, where the barons were small men, there is a want of castles. If you will run through the Black Book of the Exchequer looking for the Knights' Fees of England, and look under counties like Oxfordshire and Buckinghamshire you will find that you do not know the names of one of the barons; they are altogether very small people holding very moderate estates. I should imagine that that is the sort of thing that accounts for the want of castes. Where you have big barons you have big castles; where you have comparatively small barons they could build nothing very important. The Earls of Oxford, by the way, were very great people, but I do not know if any of you are aware that they had practically no connection with Oxfordshire. The Earls of Oxford were the greatest territorial magnates, not of Oxfordshire but of Essex, and their castle of Hedingham was a formidable stronghold in its way. The reason that they got the title of Oxford was this: They *ought* to have been the Earls of Essex, but the title of Essex was already booked for the Mandevilles. When the baronage were doubting between King Stephen and Queen Matilda, and were being conciliated, the De Vere of the day was offered the title of Earl, but he could not have the title of Earl of the county where he was most powerful. He was told that, as he could not be Earl of Essex he might either take the title of Earl of Oxford or of Earl of Cambridge. Thus the Earls of Oxford never had a real territorial connection with Oxfordshire at all. We must, therefore, in thinking of the Middle Ages, always avoid connecting the county title with the idea of dominance of the county. You may find that the Earl of Gloucester's great power is in Glamorgan, or the Earl of Oxford's great power is in Essex, and so forth. On the whole, my own conclusion is that a castleless district means a district where there were many small barons and no sufficiently big ones. There are only one or two more points that I wish to refer to. Mr. St. John Hope has mentioned the question of the shrinkage of castles—castles which had originally been big, and were made much smaller at a later date. The most curious castle of that kind that I know is the Castle of Tretower in Brecknockshire, where the rebuilder of the castle has simply inserted a little donjon in the

middle of the older shell-keep. With regard to the question of Martello towers to which Dr. Miller Maguire referred, they did turn out useless, because Napoleon never invaded England; but the theory of them was this. Martello towers were built simply to prevent a landing taking place on an exposed shore. Two heavy guns, exceedingly well protected, were put in those towers, which were constructed on the beach or shore of the South of shore wherever a landing was easy. On a level beach it is easy to see that they might have done a lot of mischief. I do not know if the origin of Martello towers is known to many here. The fact of the matter is that there was a castle in Corsica (called Mortella rather than Martello) which once kept two British men o' war at bay, and that castle simply consisted of two guns in a strong masonry circle of the smallest size. Two 74's could do nothing against those two guns, and suffered severely. The theory prevalent in 1804 was that there was a limited number of spots along the coast in Sussex and Kent, where armies could come ashore, and that if we placed little forts, with very heavy artillery, which could not possibly be dominated or put down even by a very much superior fleet, on each exposed spot, we could make a landing there extremely difficult and costly. As long as the fire of those little forts could not be subdued by the covering fleet, the landing could be made so doubtful that perhaps the enemy might not even try it. The "Military Canal" which was drawn across Kent was certainly a more doubtful device. The theory of its builders was that if the French did get ashore there should be a definite line of defence before them in the canal. But it was rather cocksure to suppose the French would land in that particular district of Kent, where they must run against the canal, rather than on any other stretch of the South Coast. As Napoleon's army never even got out to sea, we cannot tell how martellos or canal might have served; but they were part of the "insurance fund" against invasion.

Mr. W. H. St. John Hope, in reply, said: I will endeavour to answer the questions which have been asked as shortly as possible. First of all, Dr. Miller Maguire complained that I had omitted to mention the Scotch and Irish castles. I did so of malice aforethought, because it would have taken up too much time to have gone into them, and it also is really unnecessary as a matter of study. One knows that precisely the same conditions apply to the castles in the parts of Scotland that were under Norman influence at the beginning of the 12th century, as to the castles through England, and also apply to that part of Ireland which is known as the English pale. Only lately an Irishman who rose up to curse Mrs. Armitage, who had laid down this theory in black and white, ended in blessing her. Anybody who wants to read the story of the Irish castles can do so in the pages of the *English Historical Review*. My point is that the English castles were raised against the English or Saxons, whichever you choose to call them, and likewise the Danes. They were the people who were prowling up and down the rivers in the 11th Century, and gave a lot of trouble to the Conqueror. You will find that every one of the rivers and estuaries up which the Danes were accustomed to sail is dominated by one of these Norman castles. I have had to omit to refer to quite a number of castles, some of which are in Yorwkshire, that are quite notable. For instance, there is Skipton Castle, which Dr. Miller Maguire mentioned, and Scarborough, and that very remarkable castle at Skipsea right

out in Holderness, and so on. The Chairman has asked two quite important questions, as he himself said. Personally, I have never been able to differentiate between the royal castles and what he calls the baronial ones. I tried to do so, but it seems to me that although the royal castles do, as Professor Oman says, dominate the town or some important point, and have a certain strategical importance, the same argument applies equally to a very large number of the baronial castles. If we only had it on record I think we should find that one of the conditions under which the large tracts of land were given to the barons at the Conquest of England, was that they were to plant a castle on their estates to keep in order the district in which they were situated. It is very curious to see the parallel cases that occur. There are castles at Castleacre and Lewes built by the same man, William of Warren; there are also castles at Shrewsbury and Arundel both the work of Roger of Montgomery; and Tonbridge and Clare are both the work of the man called Gilbert of Clare and Gilbert of Tonbridge, and these are all planted at very important places. One cannot help seeing that Hedingham dominates very largely an important district of Essex, where there were lots of villages, just the same as the Castle of the Peak dominates the whole of the northern part of Derbyshire, and one of the Ferrers had a great castle in the South of Derbyshire at Duffield, which helped to control the passes that ran up the county. There is another point, that some of these castles were built by bishops. Newark was built by a Bishop of Lincoln, and Rochester by an Archbishop of Canterbury; and it is quite certain that many other castles, even in county towns like Shrewsbury, Norwich, and Thetford, were built for the king, so to speak, since there are no entries in the Pipe Rolls referring to their building; whereas in many other cases there is a long series of notices relating to the strengthening of these castles entered on the public records.

Berkeley Castle, by the way, I have always looked upon as one of the castles that controlled the Severn, and I think that is the purpose for which it was built. It is quite obvious on looking at the map that we do get a string of castles defended in rear by another series, as, for example, in Sussex. All these must all have been built for a purpose. The burh theory can, I think, be settled in a comparatively few words. In the first place the word "burh" has nothing to do with a castle; it simply means a fortified town. The first mention of the word which occurs in the English language is in the Anglo-Saxon Chronicle, with reference to Colchester and to London. In neither case is there any burh in Mr. Clarke's sense of the word; that is, the fortified mount of such a castle as I claim as Norman. There is no trace of any mount in either of the London castles or in London at all; and there certainly was never one at Colchester, and yet both are two very important "burhs." Then, again, why do not we find these mounts, if they were Saxon or Danish, where those two nations were prominent. You do not find them in parts of Yorkshire, or in Lincolnshire, or in Nottinghamshire, or in some parts of East Anglia, where there ought to have been a lot of them. Then a very important point is the distribution of these mounts all over the country, from one end to the other, including a large number of districts that were not Saxon or English at all. Therefore they must be the work of one dominant power, and that can only be the Norman, so they must be struck out of any theory that would make them Saxon. Further, if anyone will take the trouble, as I have done in a paper in the *Archaeological Journal*, to connote

all the entries in the Anglo-Saxon Chronicle relating to burhs, or to Saxon and Danish fortresses, will find that not only are their remains insignificant in character, if they exist at all, but in many cases they cannot be identified because all traces of them have disappeared. None of these Danish or Saxon things could therefore have been of any importance strategically. Where, too, you do find a place in the Chronicle where there is a mount, that mount can be proved to be not earlier than the Norman Conquest There is this one important point to remember, that the universal distribution of these things over the whole of England cannot be ascribed to any Saxon or any Dane, because there was no one Saxon kingdom that covered the whole of the country, and there was not any Danish King of England before the days of Cnut, and no one has ventured to assign these fortresses or any of them to his time. The oldest that we can prove the date of, historically, are of the time of Edward the Confessor, and the work of his favourites.

* "THE MATCHLESS SOLDIER MAID, BLESSED JOAN OF ARC,"

By Father BERNARD VAUGHAN, S. J.

Wednesday, 30th November, 1910.

Admiral of the Fleet, SIR GERARD H. U. NOEL, K.C.B., K.C.M.G., in the Chair.

In a day when many people are trying to make politics a substitute for religion and patriotism, it is positively refreshing to lift up the picture of a simple village maiden who became the saviour of her country, because she was drawn by that triple alliance—God, King and Country. Joan of Arc is an object lesson to every man and woman, to every boy and girl, who has the highest interests of fatherland at heart.

At the beginning of the fifteenth century, when she was born, it looked as if France and England were going to be united under one crown. Our fifth Henry crossed in 1415 to France, resolved, seemingly, not to be content till he had won the crown of Clovis for his own brow. His inheritance from his great grandfather, Edward III., he thought, would make a good foundation for further conquests, and these he pushed almost to the furthest point of success. As you know, by the Treaty of Troyes, he was appointed Regent of France during the life-time of his father-in-law, Charles VI., the imbecile, with the right to the crown when Charles should have passed away. As it happened, in 1422 our fifth Henry died, and shortly after him Charles was carried to the grave. You remember the great pomp and circumstance that surrounded the coronation of Henry VI., the child, at Paris, and how the Duke of Bedford, his uncle, was appointed Regent. While our heroine was still a child Bedford thought to win the crown of France completely for his young charge. Orleans was the one place that was needed; it must be stormed, captured, and brought under Anglo-French dominion.

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* This lecture was delivered without notes, and is given from a report taken down at the time by our reporter.

I need not remind you that, if the Salic Law obtained in France, as it did, neither our Henry V. nor our Edward III. had much legitimate claim to the crown of France. Strange to say, before Henry had been in his grave thirty years, all that he had inherited from his forefathers, as well as all his own conquests in France, were lost except what stood behind the walls of Calais; and what England lost she never regained. Finally that "fairest gem that sparkled in her diadem"—Calais—was lost to England and its name was written on the broken-hearted Mary's heart. I want the circumstances of the case put before you, and so I have briefly recapitulated these facts, which I ask you for the moment to bear in mind.

Here let me also remind you that during the fifteenth and sixteenth centuries there was hardly a good word to be said in England for Joan of Arc. In the seventeenth and eighteenth centuries she comes a little more to the front, and in the eighteenth and nineteenth, especially after Quicherat had published the evidence of the trial, she stood full height before my countrymen, while in this twentieth century we have made a splendid act of reparation to her. We thought when we were beaten that we were beaten by a devil-worshipper, by one sent to us by the Evil Spirit. I never could understand that. I think that my countrymen ought never to have paid such a compliment as that to the Devil. I can quite understand even England being beaten when she had to contend with one sent against her by Almighty God, but when sent by the Devil!—I would pay him no such compliment; I would tell him to go to his own place, to hell.

To-day I am going to put before you as briefly as possible an outline story of this matchless soldiermaid. She is simply magnificent, she is inspiring. It would be well for every Englishman to study her character, for he would then be truer to King and Country. Wonderful! that in this age of Democracy we should be able to lift up the portrait of a little village maiden and point a lesson which all of us need so much to-day. I am going with your kind permission to tell the story as simply as she told it herself. I have no sympathy with Anatole France, nor with Jules Blois, who, emulating the so-called art of Renan and Sabatier, have given their interpretations of her life, because her own does not suit their theories of this world. But Anatole France and Jules Blois, with some others, may be just shown the door with Renan and Sabatier, those other two romancers who read their own story, into the lives of our Divine Saviour and St. Francis of Assisi.

In the province of Champagne, in France, near Vaucouleurs there is an unpretending village called Domrémy. Here in a modest homestead, standing near the village church, was born on the Eve of the Epiphany, 1412, Jacques and Isabelle d'Arc's fifth child and second daughter. They christened her

by the name of Jeanne, and she grew up a typical little French Catholic girl, fond of weaving flowers for fairy trees, as I daresay you and I have done in our childhood; and fonder still of gathering great bouquets of wild flowers to put at the feet of the First Woman of creation—God's Mother. This bright child grew up with her brothers and sisters, lithe and vigorous, with a healthy kind of piety, not goody but thoroughly good; strong, well braced-up and splendidly built, spiritually as well as physically. Nothing very much happened, or nothing that I need tell you, during her earlier childhood days. She was a little girl pure as the waters that danced beside her home, bright as the bloom that decked her garden plot, sweet as the herbs hidden within the woods, and as full of promise of summer as the love songs of the birds that flew from tree to tree. This bright live poem of a girl was, one day in her thirteenth year, working in the garden, helping her father, when suddenly she noticed a great light, and there appeared the form of some sainted creature, who had a message for her. It was St. Michael. He came and he went, and with him came and went two others, St Margaret and St Catharine. They appeared for two or three successive years, coming and visiting her many times weekly. There was nothing of illusion about this simple healthy girl in her ideas of what she saw, for she saw them and looked at them and felt them and pursued them, and kissed the ground on which they were and tried to hold them from fading away into space. They had a message for her! What was the message? St Michael told her that she was called upon by God to raise the siege of Orleans, and to see her King crowned at Rheims; that she was to go to Robert de Baudricourt, the Governor of Vaucouleurs, and to ask for an escort to Chinon, above the Dinon, a tributary of the Loire, where she should thresh this out with His Majesty the Dauphin.

I must not linger here, but pass on to tell you that in 1428, more than two years after her first vision and the first time she heard the Voices, she found herself face to face at Vaucouleurs with Baudricourt, who scanned her and looked at this little village girl in her teens with her hair down her back, with a white coif about her brow and her little red dress, simple as any child from any simple village. He recommended that she should go back home, and, according to the language and practice of the day, suggested that a little sound whipping might do her good. Whether she got the whipping, I do not know, but she returned very disappointed, but not a bit discouraged. No man or woman has any reason ever to be discouraged, so long as there is the open door beyond.

For a year she tried to get out of this mission, but she was urged to go, and then, at the end of January, 1429, she turned her back upon her home and made her way to Baudricourt, who this time heard the same story; but I suppose he was acted on just as she had been, and instead of recommending that she

should be sent home and be punished, he furnished her with an escort to take her with letters from him to the Dauphin, who was living at his ease in the fortress castle at Chinon. For the first time this child leaps into the saddle, her hair cropped, with doublet and horse and spurred boots. She rides for eleven days and draws rein at length under the archway of the castle, after she had spurred her charger up the hill. Then she waited for her interview with the Prince. La Trémoïlle, the royal adviser, did not like the idea of a village girl coming to dictate a policy and to lead French armies under the French flag to victory. A little jealousy, a little envy, even under the brilliant uniforms of the army!—little object-lessons as we go along. This girl was kept waiting before the Dauphin would see her, and I think it was on the eighth of March she was told she was wanted in the great banqueting-hall. Accoutred as she was, in doublet and hose and spurred boots, she crossed the threshold and met the Dauphin, or rather met his entourage, a blaze of glory and a shimmer of gold and colour, simply and quite at home. Really spiritual people, even taken from the peasantry, are as much at home with the highest as with those of the lowest rank, God's training to courtesy is so sublime. Well, this girl looked round for the Prince. He, partly perhaps through mischief and partly to discover whether her mission was a true one or not, hid himself among his retainers, but she went up to him and told who he was, in spite of his trying to put her off, and said, "May God grant you many years of life." She called him aside, and told him her story, and he believed her, but he could not act. She was submitted to many tests and cross-examinations and—clever girl as she was—she was a match for them. For instance, let me just point out one thing. One, a monk, a provincial man with a provincial accent, put a cross-question to her, "In what language did St Michael speak to you?" She answered, "In better French than yours."

On the 27th of April we find that this girl, who could neither read nor write, who had never sat a horse till she vaulted into the saddle to meet her future King, who had never drawn a sword, is at the head of a great army. With Xaintrailles, La Hire, and the rest she moves from Chinon to Orleans, to fulfil the first purpose of her God-sent mission. After two days in the saddle and two days on the ground in her armour—for she never would unbuckle her armour, except when her own sex were with her—this girl found, rising before her, the city that was loyal to her Sovereign, and as the story of its vicissitudes poured themselves into her poor brain and as she thought of all they had suffered for their flag and for their Sovereign, girl-like she wept her sad bosom empty. But she was not one to dally with tears; she was up and doing. A day or two after, Dunois came forth to meet her and feigned an attack upon the fortress of St Loup, and she with two hundred fighting men passed into the city unhurt and untouched by any javelin from the English

foe. She surprised those well-trained generals, like Dunois, La Hire, D'Alençon, by her marvellous, seemingly miraculous, knowledge of the tactics of war. She reconnoitred the ground, tested the lines of defence, she inspected her troops, she looked to the kit, she found what was wanting, she looked for points of vantage. She seemed to be especially skilled in all matters connected with artillery—this girl who had never discharged an arquebus, who had not learnt to ride or fight, who could neither read nor write. "The weak things of this world hath God chosen to confound the strong, and the foolish to confound the wise." He was doing it now.

On the 4th of May, in the afternoon, the Maid astonished foe as well as friend. She went forth leading an attack on St. Loup. The English were full of expectation of ultimate victory. The battle of the Herrings had seemed to settle the case, in their favour; besides the French were nearly starved into capitulation. Had not Dunois thought of giving up the keys to the Burgundians: only Bedford objecting said, sportsmanlike, "No, those who have beaten the covers must have the birds." And so they had fought on. This afternoon, May 4th, for the first time Joan of Arc saw battle, and the terrors and the horrors of war, than which there can be nothing worse. Again she wept to see how the men were slaughtered about her; but a shout of triumph that came from the French walls of defence proclaimed that for the first time, after months, there was victory for France, that the English had been actually worsted. They seemed to have been almost paralysed by what they thought was a devil-sent girl, a witch, an enchantress. On the 7th of May the Soldier Maid said the siege must be raised, and she drew forth her forces and attacked not St Loup, which had been taken in the first fight, but Les Tourelles, the great fortress which stood on the bridge which with its fifteen arches, spanned the river. Cannon was mounted on the walls and on the forts held by the English. The Maid led forth her forces, her spearmen and her archers, who were to make straight for Les Tourelles, that central fort of the English. And as she stood by—because she never herself drew a sword, she never drew blood—she urged her countrymen to do their work bravely and well. The battle was disputed now by the one side and then by the other, every inch of ground being obstinately fought for. But victory seemed to favour the side of the French, who fighting at the side of the maiden and at the sound of her voice felt that they were called by God to carry out their great mission for their King and Country. While the warrior-maid stood encouraging her fighting men beside the fortress wall, a shaft winged by an English bowman caught her in the neck and she reeled and tottered and fell. This disaster gave the English fresh courage, thinking the enchantress was at last laid low by their countrymen; but soon, with her own hand having drawn out the barb, she was seen again urging on her men, until at

last they flung themselves upon this great bridge and seemed to fill the Tourelles. Presently fires were seen blazing and presently the bridge gave way, and the English, as they tried to make to the mainland, found the bridge was broken down, so that those who were not drowned, and those who were not burned were slaughtered by the maiden's men. She recalled her troops and returned at night after the victory. In the morning some watchmen from the towers, looking over the land in the occupation of the English, found that their tents were struck and that they were nowhere to be seen. After a Mass of thanksgiving, the Maid of Orleans thought only of pressing on to meet her King. She had raised the siege. How it had been achieved, who can tell? One thing is certain, that one of the decisive battles of the world, one which settled our position in France, was won by a village maiden, who could neither read nor write, but who knew she had a mission.

She met the Dauphin, and he gladly recognised her great services to the country, but when she urged him to push forward to Rheims to be crowned, he could not be made to stir. He was a real princeling, an idler. He had splendid work to do; he had all in his hands, and yet with folded arms and crossed legs he lost time, he did nothing, a girl, a village girl, having to do his work for him. She did it far better than he could have done it.

At Jargeau she met the bold, stubborn and dauntless Suffolk, and there she fought him, and he was taken prisoner. At Patay, Talbot, who had known nothing of defeat, had to yield to her forces. She cleared, she swept the valley of the Loire, and to make a long story short, she at last compelled by her achievements the Dauphin to follow her to the gates of Rheims, which on the 16th July were flung open to receive him. There, led by the Maid, the King, amid the pealing of bells, the braying of trumpets, and the shouts of the people, took possession of his royal city. Next day he was seen kneeling in the sanctuary of the cathedral with bishops and abbots and priors and serving-men beside him, the body of the great basilica filled to overflowing with the peers, knights, and generals in his service, and presently the crown of France was lifted above his brow and he took his oath to defend his people and to be their true sovereign. Then it was that the Maid would have liked to have felt her work was done. But never again was she to pace beside that river that made music by her home; never again was she to see the sun setting in glory behind the village green; never again was she to hear the chimes of those bells in the tower of the church which was to her the dearest, holiest spot on earth. Her mission now was to lead her forces to Paris, the capital; but neither 'Alençon, Dunois, nor other generals, not even the maiden herself, could persuade this sluggard prince to come forward and hold his own. They

arrived in August at St. Denis, outside the walls of Paris. Again they petitioned him to come. "Just show yourself, Sire, before the walls of Paris and all will come and offer you allegiance." But the King said, "To-morrow, to-morrow," but that "to-morrow" never came.

On the 8th of September, she gathered her forces about her and led her men to the gate, St Honoré. Banner in hand she leapt through the first moat, plunged through the second, and like an athlete was about to scramble up the slope of the ramparts, urging her men and her archers to storm and take the citadel in the name of their sovereign and country, when again some bowman's arrow plunged into her shoulder, and presently faint with blood she fell into the moat. The men lost heart, and when the sun was down they lifted her up and carried her to a little village between the city and St Denis, and next day, when she hoped to renew the attack she was told by de Gaucourt that the King had sent orders that she must not storm the city, nay, that by his command the bridge over which she would have had to pass to do it was by his orders broken down. She could scarcely believe he had been so ill-advised. She was terribly disappointed, but not at all downcast. She had done her duty, and no one doing duty need or ought to be discouraged.

She went away, as so many had gone before her and so many will go after her, in sorrow to the shrine of God's Mother, where unbuckling some of her armour, she laid it at the feet of Her whom all Christians call the Help of Christians and the Comfort of the Afflicted. She rose up from the shrine and went forth to meet God's will. What a character! One ready not merely to do, but, what is much braver, to bear God's will. So this girl found that her occupation seemed gone. There was so much jealousy, so much ill-feeling about her position. It was so anomalous, it was so seemingly abnormal, that she found it almost impossible to get permission from the King to do the things she knew she ought to do. That long winter gave her an opportunity of moving about, like her Master, doing good. She was claiming a finer victory than she had ever won over others; she was winning it over her own self, and she learned to gain it among the sad, the sick and the suffering. Among the sorrowful she built up a character that defied competition.

Now when the spring came round—because I must hurry on—she found an opportunity of doing something for her sovereign. She thought she must go to the relief of Compiègne, one of the last strongholds, loyal as loyal could be to this poor makeshift of a King, I was going to call him a puppet King; he was not of the stuff that made a St Louis of France. She thought she must go to the relief of Compiègne, for the Burgundians and the English were closing in around it, tightening their grip upon it. So to Compiègne she went, this girl who

was so completely in the hands of her Maker. Do you know, that when she was not in the saddle she seemed to be on her knees—this girl who had no complaint to make of anyone, who was by her character like a tower for all time in the landscape, not merely as a landmark, but as a thing of beauty and of joy to her country for ever. This child managed to make her way into Compiègne, and on the 23rd of May 1430, at sundown, when she thought the Burgundians and the English would be unbuckling their armour and retiring for the night, she swept from under the portcullis over the bridge, deployed her forces, took their positions, and swept with all her force down upon the Burgundians. They, quick as lightning, rallied, mounted their chargers, and, being many hundred times more numerous than the little five hundred of foot and horse under her command, drove her forces back. As they retired and were about to beat a retreat and to get within the citadel, they were intercepted by the English, while she, as she turned her charger's head and was riding over the bridge hoping to find a shelter behind the city walls, saw the drawbridge rise up before her and the city shut out for ever from her sight.

The rest of the story you know. She was captured. You know what Bedford thought of her, how he wrote to her King, saying that she was an ill-conditioned woman, dressed in man's clothes and leading a bad life. They could not believe in this girl; they would bring her to trial. Having bought the girl for a price, Bedford first thought of Paris, but he could manipulate Rouen better, so to Rouen the maid was brought for trial. You know how she was kept in that tower; how she was held by chains within a sort of iron cage, like a wild beast who might not be let loose even behind iron bars; how for months she was under the eyes of rabble soldiers, rude rough men of those times. Think of the exquisite tortures of a pious maiden, not for a moment, not for a second, day or night, to be screened from the rude gaze of men so vile. It was a condition of things worse than any other trial. You know what a relief it was to her when her would-be mock trial at last began in the February of 1431, when she was brought forth to find herself before her judge, Cauchon, Bishop of Beauvais, Jean Lemaitre, the Vice-Inquisitor, and Estivet, the Promoter.

Was there ever such a trial?

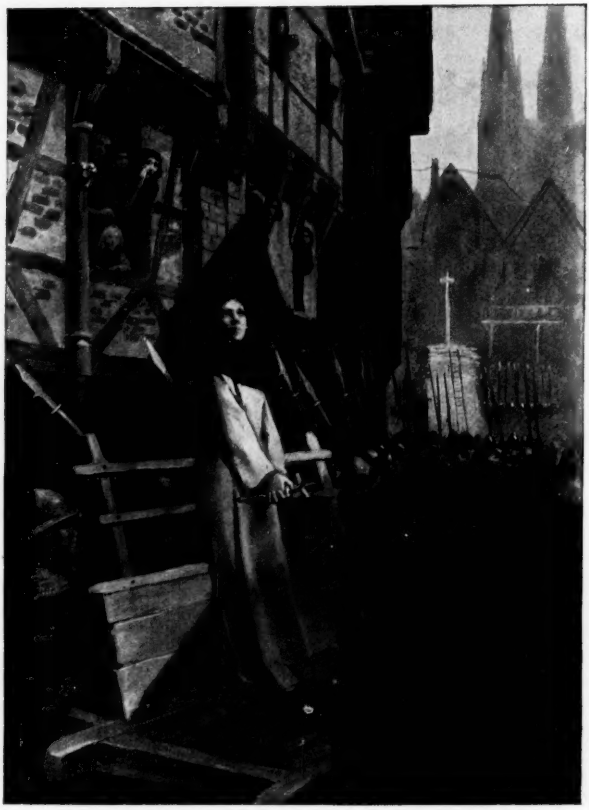
There was once; when her Master was tried, when there was not a voice raised on His behalf. She played a good second. She showed forth His hidden life, His public life. She was going through His Passion-tide, and presently she shall pass into His life triumphant. Marvellous! Wonderful. Some people say, "What a pity she was not called hence before!" No, let the girl win her crown; win her spurs by passing through the valley of the shadow of suffering which alone can build character.

So she passed through this trial. I need not harrow your feelings—indeed there is no time, even if I wished to do so—by telling you the horrors of it. How they tried in every conceivable diabolical way to get her to say what they could against truth and then to make out that she had said what she had not said. You know how the day came when they showed her the torturers and the tortures that were prepared for her as an enchantress, a witch, and a heretic, and how for the moment she seemed to lose her self-confidence, her self-control. But she rallied splendidly, and declared that if they were to tear her limb from limb she would still be true to her Voices and that she had only carried out the mission to which she had been deputed, the work with which she was charged by Him Who is the Master of us all.

At last the fatal day arrived, the 30th of May, when she was told that she must go forth to be burned alive. She was found guilty of being a devil-worshipper, a traitress, and idolator, a suicide, one in despair, a schismatic; and the French University endorsed all that and added "And she is, too, a liar and an enchantress." She heard the verdict; she fortified herself with the Bread of the strong and the Wine that brings forth virgins. She clothed herself in the garments of innocence, like her Master; she mounted the cold grey waggon that was drawn up by her prison door, and she passed slowly over the cobble-stones, amid the gaze of the people who had come forth to see her die. The waggon halted in the great market-place, where there were ten thousand persons waiting to see her burned to death. Presently she mounted the scaffold. Her hands were tied to the stake; she looked up and round, proclaimed that she had been true, and then she saw the great faggots lighted beneath her, and the flames began to toss their heads and to leap around her, swaying about her, licking at her clothes. A cloud of smoke hung like a funeral pall over the fire. Then, above the shouts of the people and the screams of the children, the hissings of the flames, and the noise of all about, piercing this funeral canopy and rising over all, was lifted a voice, and its sound seemed to pentrate right into the land beyond the stars—a pleading, plaintive voice calling out: "Jesu, Marie! Jesu, Marie! Jesu! Jesu! Jesu!"

The Chairman (Admiral of the Fleet, Sir G. H. U. Noel): We have heard a very interesting lecture, one which will I hope teach us a great deal. There are two sides to this question, one a very dark one, the other a very bright one.

The dark one is perhaps typical of what occurred, or what was the custom six hundred years ago. The mere fact of any woman being dubbed a witch was quite sufficient to put all the world against her. And not only six hundred years ago, but even within the last two hundred years witches have been taken to the stake. But the bright side of the question is that this evidently



LOOKING BEYOND WHENCE HELP NEVER FAILS

FROM THE PAINTING BY GASTON BUSSIERE.

From "Life Lessons from Joan of Arc," by permission of the Publishers, George Allen & Sons, Rathbone Place.

simple, lovable young woman from the country should have been entrusted with such an extraordinary mission. (I am only a naval officer and I feel there ought to have been a general in the chair to-day.) I have recently read Andrew Lang's excellent book on this subject, which, from a Scotchman and probably a Presbyterian, would perhaps command a stronger feeling in her favour than even the excellent lecture to which we have been listening. How could that girl have been endowed with the highest gifts of generalship if she had not been inspired? Anyone who has been listening to this lecture cannot be otherwise than convinced that this child was absolutely and directly inspired. What a lesson this is to the women of every country! Here is a girl who has a mission, an inspired mission, to place her King on his throne, next to unite the whole of her country as one, and to expel the enemies of her country from France. But what are ladies doing now? I fear that it is mostly fighting for their own benefit. Would it not be better if some at least were to try to follow the excellent example of Joan of Arc, and to do their best to unite our countrymen, and not only our countrymen, but the people of our Empire, and also to keep the enemy from fooling us? With these few words I am sure I have your instructions to thank Father Bernard Vaughan heartily for his excellent lecture.

ASTRONOMY FOR THE ARMY.

By Lieutenant E. W. COX, R.E., 1st Field Troop, Aldershot.

IT is of no practical use to a soldier to be able to determine his latitude, his longitude, the error of his watch, or the true bearing of any natural feature he can see, with the aid of scientific instruments. On service he will have only his eyes, a compass and a watch to help him, and it is fair to assume that both compass and watch may be lost or broken.

The object of this paper is to show how the sun and stars can be used to replace either a compass or a watch, and, under certain conditions, to replace both.

This practical use of the sun and stars is open to every soldier, however unfamiliar with the science of astronomy he may be. Night operations tend to become more frequent with every campaign, and there is no reason why the stars should not be as helpful to the men of a strategic patrol as they are to the staff officer who directs a large column.

It is possible, with the help of a few simple tables, to calculate on any day, and at any place—

(*a*) The time of sunrise and sunset,

(*b*) The true bearing, and height above the horizon, of the sun at any hour of the day,

(*c*) The true bearing of any bright star at rising and setting, and

(*d*) The number of hours that such a star is above the horizon.

With these facts, and a knowledge of the apparent movements of the sun and stars in the heavens, it is possible, except when clouds entirely obscure the sky, to use the sun and stars instead of landmarks, and after a little practice, instead of watches.

As it is obvious that all the movements of celestial bodies, which are referred to in this paper, are *apparent* movements, the term will not be applied to them again.

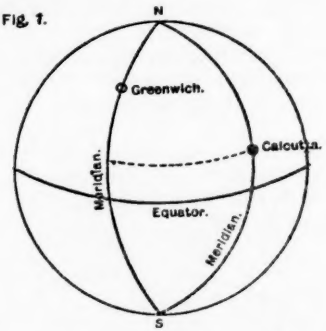
Before any calculations are attempted, a few astronomical terms must be explained.

The *meridian* of a place is an imaginary circle on the surface of the earth, passing through both the North and South poles, and that place. When the sun is due N. or S. of a place it is said to be "on the meridian" of that place.

In Fig. 1 are shown the meridians of Greenwich and Calcutta.

The *latitude* of a place is its distance N. or S. of the equator, measured in degrees. A degree is about 70 land miles, and there are 90 degrees between either pole and the equator. A place which is nearer either pole than the equator is said to be in a "high latitude," while a place which is near the equator is said to be in a "low latitude."

Fig. 1.

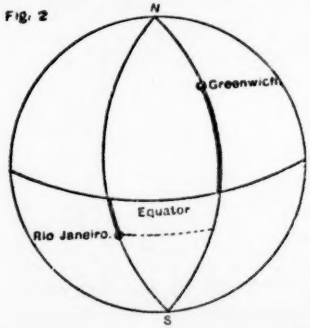


In Fig. 2 the thick lines show the latitudes of Greenwich, 51° N. (high), and of Rio Janeiro, 23° S. (low).

The *longitude* of a place is its distance East or West of the meridian of Greenwich, measured in degrees or hours.

A degree is 4 minutes of time, and, as the earth rotates once in 24 hours, it is clear that there must be 360 degrees of longi-

Fig. 2



tude, 180 East and 180 West of Greenwich. Longitude can be measured from any meridian, and in French maps the meridian of Paris is taken as the "standard meridian."

In all British maps the meridian of Greenwich is the standard.

In Figs. 1 and 2 the dotted lines show the longitudes of Calcutta, 88° E., and of Rio Janeiro, 43° W.

The *celestial sphere* is an imaginary sphere, infinitely large, with the earth as centre.

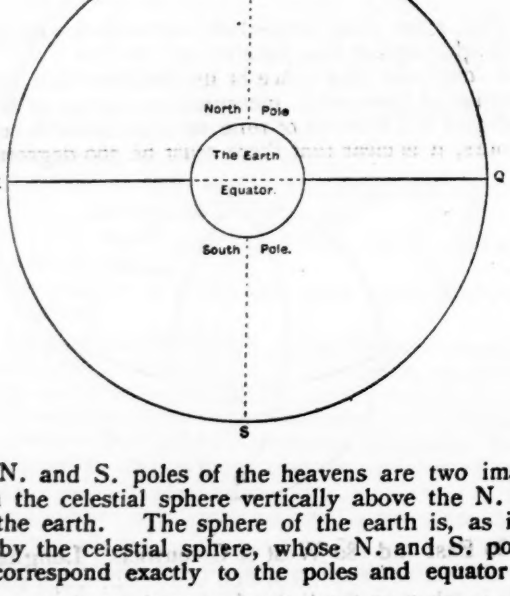
The heavenly bodies appear to move on the surface of this sp. .re.

The *celestial equator* is an imaginary line on the surface of the celestial sphere, marking where the latter is cut by the plane of the equator of the earth.

To an observer standing on the equator the celestial equator divides the heavens into two equal parts, passing vertically over his head, and meeting the horizon at points due E. and W. of him.

To an observer who is not on the equator the celestial equator meets the horizon at points due E. and W. of him, but is tilted towards the N. or S. according as he is South or North of the equator.

Fig 3.



The N. and S. poles of the heavens are two imaginary points on the celestial sphere vertically above the N. and S. poles of the earth. The sphere of the earth is, as it were, enclosed by the celestial sphere, whose N. and S. poles and equator correspond exactly to the poles and equator of the earth.

In Fig. 3 NQSE is the celestial sphere, N and S are the North and South poles of the heavens, and EQ is the celestial equator.

The *declination* of a heavenly body is its distance N. or S. of the celestial equator, measured in degrees.

In Fig. 4 the thick lines show the declinations of Arcturus Boötis), 20° N. and of Sirius (Canis Majoris), 17° S.

Fig. 4.

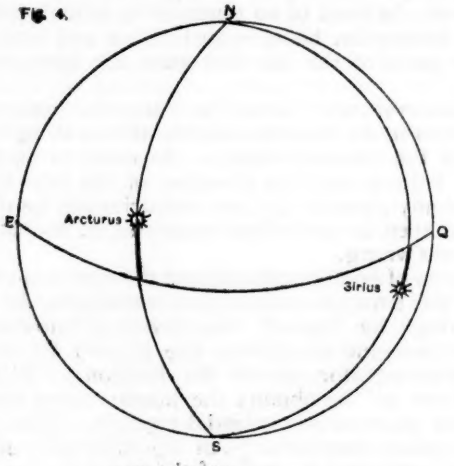
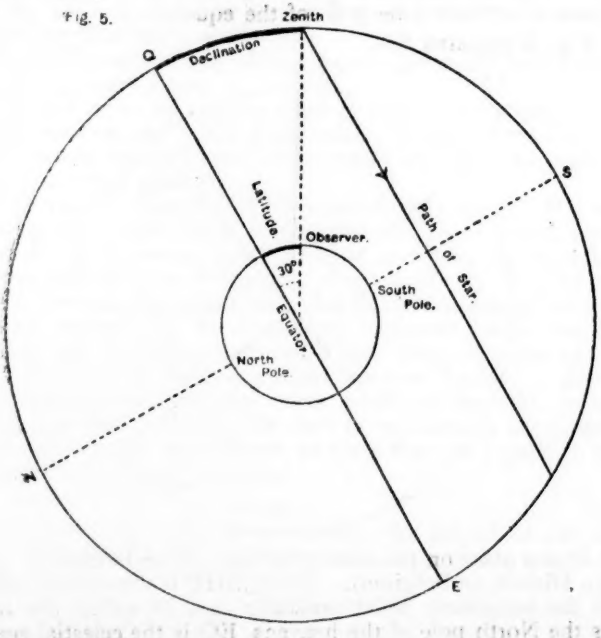


Fig. 5.



The declination of the sun is constantly changing, but the declinations of the stars are always the same. The stars appear

to revolve round the N. and S. poles of the heavens always at the same distance from the celestial equator.

It is clear from Fig. 5 that a star whose declination is, for example, 30° S. will, at the highest point of its path, pass directly over the head of an observer in latitude 30° S.

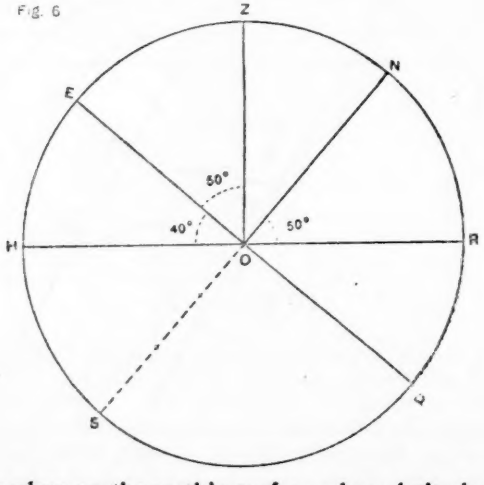
This connection between declination and latitude is useful when the paths of the sun and stars are being traced in the heavens.

An observer who wishes to learn the movements of the sun and stars in the heavens must be able to imagine the correct position of the celestial equator. In order to do this he must know his latitude and the direction of the true North. The latitude of any place in civilised countries can be obtained from maps, and even in uncivilised countries an estimate can rarely be 5 degrees wrong.

Methods of finding latitude and the direction of true North, where neither a map nor a compass is available, are given below in "Bearings by Stars." An observer, knowing his North point, can imagine the points, due E. and W. of him, where the celestial equator meets the horizon. Subtracting his latitude from 90° he obtains the height above the horizon of the highest point of the celestial equator. This point will be on his meridian, that is due S. of him if he is N. of the equator, and due N. of him if he is S. of the equator.

Fig. 6 explains this.

Fig. 6



O is a place on the earth's surface whose latitude is 50° N. (*e.g.*, Dinant, in Belgium). ZNRQSHE is the celestial sphere. Z is the imaginary point vertically over O, called the zenith, N is the North pole of the heavens, EQ is the celestial equator, and HR is the horizon.

The latitude of O is 50° N., that is, the angle EOZ is 50° As the angle ZOH is 90°, the angle EOH must be 40°, or, in other words, E, the highest point of the celestial equator, is 90° minus 50° (the latitude) above the horizon.

E is also on the line NZS, that is, on the meridian of O, and therefore, as O is North of the equator, E is due South of O.

To an observer who remains in the same latitude the path of a star through the heavens is always the same, from the time it rises above the horizon to the time of its setting, although it does not pass across the heavens at the same time every night.

If the observer moves to a place in a different latitude he will notice that the star, though rising and setting at approximately the same points as before, swings up to a different height on the meridian, because the celestial equator is tilted up at a different angle.

An observer who knows the declination of a star and his own latitude can, at any moment when the star is above the horizon, trace the rest of its path through the heavens. He knows the correct position of the celestial equator, and he knows that the star always keeps at the same distance from the celestial equator.

Summing up the above points, an observer who knows his latitude and the direction of true North can at any moment trace the path of any star he can see, provided he has some table giving that star's declination.

Table IV., at the end of this paper, gives the declinations of all the principal stars.

It is not quite so easy to trace the path of the sun in the heavens, because the sun's declination changes every day, or, in other words, the sun does not always keep the same distance from the celestial equator.

Whereas an observer at Greenwich, latitude 51° N., will see Sirius night after night during the month of January rise about S.E. by E., swing up to a height of 22° on the meridian, and then sink down to its setting about S.W. by W., he will find that the sun rises every day at a slightly different point in the East, swings up to a slightly different height on the meridian, and sets at a correspondingly different point in the West. If, however, he has a table, such as Table II., giving the declination of the sun for every month of the year, he will be able, provided he knows the date in addition to his latitude and the direction of true North, to trace the sun's path in the heavens on any day of the year.

Rule I.

A rule can be given for predicting the height of the sun at noon (its greatest height during the day) at any place on any day.

Find the latitude of the place, and the declination of the sun (from Table II.).

If both are N., or both are S., subtract the smaller from the greater, and subtract the remainder from 90°.

If one is N., and the other S., add them together, and subtract the sum from 90°.

EXAMPLE I.

Required the height of the sun at noon:—

(*a*) At Aldershot on 9th May.
(*b*) At Bulawayo on 22nd December.
(*c*) At Dinant (Belgium) on 30th October, and
(*d*) At Melbourne on 22nd June.

(*a*) Latitude 51° N. (from map).
Declination 17° N. (from Table II).

Subtract 34° from 90°.
Required height is 56°.

(*b*) Latitude 20° S. (from map).
Declination 23½° S. (from Table II).

Subtract 43½° from 90°.
Required height is 86½°.

(*c*) Latitude 50° N. (from map).
Declination 13½° S. (from Table II).

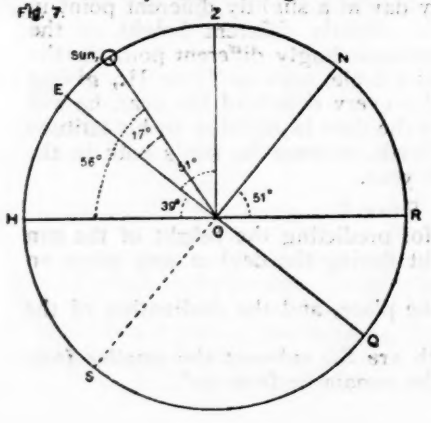
Subtract 63½° from 90°.
Required height is 26½°.

(*d*) Latitude 38° S. (from map).
Declination 23½° N. (from Table II).

Subtract 61½° from 90°.
Required height is 28½°.

Figs. 7, 8, 9 and 10 explain the above examples. There is no necessity to draw a figure unless Rule I. has been forgotten.

Fig. 7.

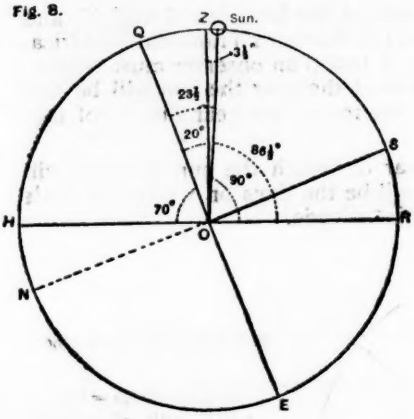


(a) ALDERSHOT, May 9th.

ZOE (latitude) = 51°
∴ EOH (tilt of celestial equator) = 39°.
Sun OE (declination) = 17°
Sun OH (height of sun) =
Sun OE + EOH = 17° + 39
= 56°.

It is evident from Table II., in conjunction with Rule I., that an observer at, for example, Aldershot, between 22nd December of one year and 22nd June of the next, will see the

Fig. 8.



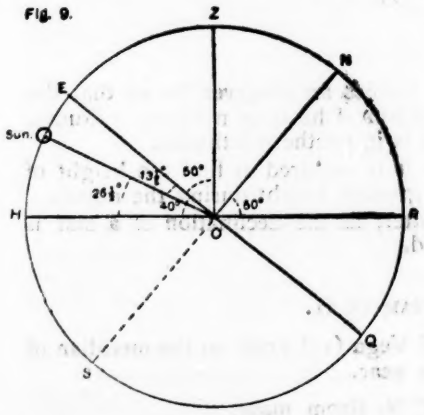
(6) BULAWAYO, Dec. 22nd.

ZOQ (latitude) = 20°.
Sun OQ (declination) = 23½°
∴ Sun OZ = 3½°.
ZOR = 90°.
Sun OR (height of sun)
= ZOR − Sun OZ
= 90° − 3½° = 86½°.

sun swing up higher every day at noon, till on 21st March it follows the celestial equator throughout its path across the heavens, and therefore reaches a height of 39° at noon.

From 21st March onwards the sun is North of the celestial equator, and swings up still higher day by day until on 22nd June it reaches its greatest height of 62½°. After 22nd June

Fig. 9.



(c) DINANT, Oct. 30th.

ZOE (latitude) = 50°.
∴ EOH (tilt of celestial equator) = 40°.
Sun OE (declination) = 13½°.
Sun OH (height of sun)
= EOH − Sun OE
= 40° − 13½°
= 26½°.

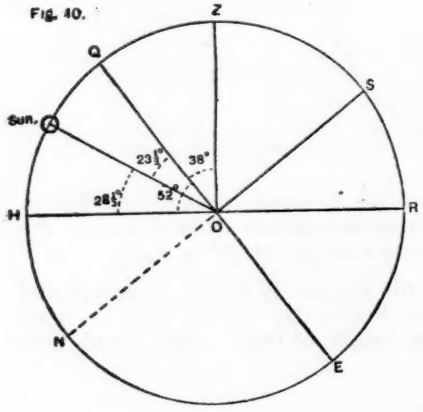
the sun gets lower every day, until on 23rd September it is on the celestial equator again. Finally, on 22nd December, it only swings up to a height of 15½°, its lowest height of the year.

This annual variation is the same in extent to observers all over the surface of the earth. Its cause is explained in an Appendix.

In the tropics, that is between the latitudes of $23\frac{1}{2}°$ N. and $23\frac{1}{2}°$ S. (between Assouan and the Northern Transvaal in Africa, and anywhere S. of Calcutta in India) an observer must remember that during certain months of the year the sun will be due N. of him at noon, and for the rest of the year due S. of him at noon.

The two days of the year on which the sun at noon will be vertically over his head will be the days on which the sun's declination is the same as his latitude.

Fig. 40.



(d) MELBCURNE, June 22nd.

ZOQ (latitude) = 38°.
∴ QOH (tilt of celestial equator) = 52°.
Sun OQ (declination) = 23½°.
Sun OH (height of sun)
= QOH − Sun OQ
= 52° − 23½°
= 28½°.

Anywhere outside the tropics an observer knows that the sun at noon is always S. of him if he is in northern latitudes, and always N. of him if he is in southern latitudes.

Rule I. also applies if it is required to find the height of a star on the meridian (its greatest height during the night).

The date does not matter, as the declination of a star is the same all the year round.

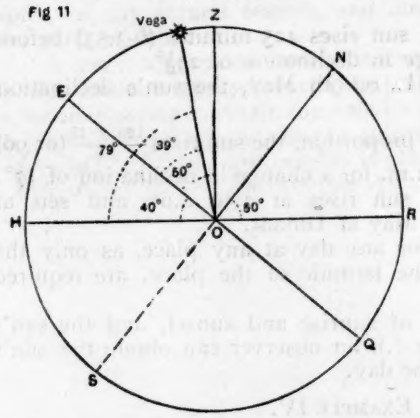
Example II.

Required the height of Vega (α Lyrae) on the meridian of Dinant, on any date in the year.

Latitude 50° N. (from map).
Declination 39° N. (from Table IV).

Subtract 11° from 90°.
Required height is 79°.

Fig. 11 explains this.



VEGA AT DINANT.

ZOE (latitude) = 50°.
∴ EOH (tilt of celestial equator) = 40°.
Vega OE (declination)=39°.
Vega OH (height of star)
= Vega OE + EOH
= 39° + 40°
= 79°.

When it is remembered that stars rise 4 minutes earlier every night it will be evident that in every month some stars will not be above the horizon during the night. They will rise and set during the day.

The question of the selection of suitable stars will be dealt with later.

The necessity of fixing in the imagination the tilt of the celestial equator cannot be too strongly urged upon any who would make an intelligent use of the sun and stars.

A sound knowledge of the movements of the sun and stars, and the changes to which those of the sun are liable, is essential before any practical use can be made of them, and it is only by means of the celestial equator that the paths of the sun and stars can be traced.

An observer who has gained this knowledge may reasonably consider the question of using the heavenly bodies for time and bearings.

Time by the Sun.

The first point to be remembered is that the time of sunrise and sunset varies in different latitudes. On only two days in the year, 21st March and 23rd September, does the sun rise at 6 a.m. and set at 6 p.m. all the world over.

Example III.

Required the time of sunrise and sunset on 9th May at Dinant.

The latitude of Dinant is 50° N. (from map). 9th May is nearer the longest day than the shortest day.

From Table I., for latitude 50°, the sun rises at 3.55 a.m. on the longest day, when its declination is 23½°

But it is known that the sun rises at 6 a.m. when its declination is 0.

Therefore the sun rises 125 minutes (6-3.55) before 6 a.m. for a change in declination of $23\frac{1}{2}°$.

From Table II., on 9th May, the sun's declination is 17° N.

Therefore, by proportion, the sun rises $\frac{125 \times 17}{23\frac{1}{2}}$ (or 90) minutes before 6 a.m. for a change in declination of 17°.

That is, the sun rises at 4.30 a.m. and sets at 7.30 p.m. on 9th May at Dinant.

This can be done for any day at any place, as only the sun's declination, and the latitude of the place, are required for the calculation.

Knowing the times of sunrise and sunset, and the sun's height at noon (by Rule I.), an observer can obtain the sun's height at any hour of the day.

Example IV.

Required the height of the sun at every hour between sunrise and sunset on 30th October at Maritzburg (Natal).

Latitude is 30° S., and 30th October is nearer the longest day.

From Table I., for latitude 30°, the sun rises at 5.2 a.m. on the longest day, when its declination is $23\frac{1}{2}°$.

But the sun rises at 6 a.m. when its declination is 0. Therefore sunrise is 58 minutes before 6 a.m. for a change in declination of $23\frac{1}{2}°$.

From Table II., on 30th October, the sun's declination is $13\frac{1}{2}°$ S.

Therefore sunrise is $\frac{58 \times 13\frac{1}{2}}{23\frac{1}{2}}$ minutes before 6 a.m. for a change in declination of $13\frac{1}{2}°$.

That is, the sun rises at 5.27 a.m., and sets at 6.33 p.m. on 30th October at Maritzburg.

By Rule I. the sun's height at noon is $73\frac{1}{2}°$.

A table of times and heights can now be made.

At	5.27	a.m.	and	6.33	p.m.	the sun's height is		0.
,,	6	a.m.	,,	6	p.m.	,,	,,	6°.
,,	7	a.m.	,,	5	p.m.	,,	,,	17°.
,,	8	a.m.	,,	4	p.m.	,,	,,	$28\frac{1}{2}°$.
,,	9	a.m.	,,	3	p.m.	,,	,,	40°.
,,	10	a.m.	,,	2	p.m.	,,	,,	51°.
,,	11	a.m.	,,	1	p.m.	,,	,,	62°.
,,	noon					,,	,,	$73\frac{1}{2}°$.

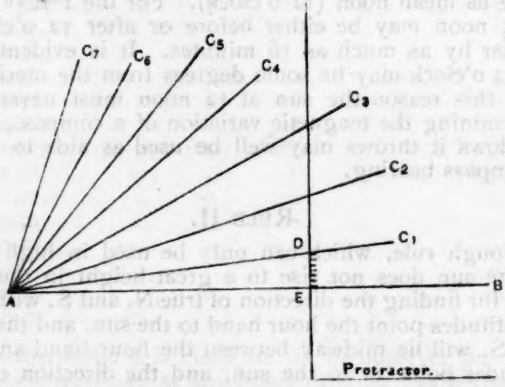
If an observer possesses any rough means of measuring the height of the sun, for example, the clinometer on a cavalry sketching board, he can obtain his time from the above table.

In order to be independent of a clinometer an observer should be able to measure the height of a heavenly body by the palm of his hand held at arm's length.

The number of degrees that the palm measures can be obtained at any time by taking the height of a roof, church spire, or any natural feature, and measuring the height with the palm of the hand.

A more convenient method in low latitudes, where the sun is high in the heavens between the hours of 9 a.m. and 3 p.m., is for an observer to obtain the time by the length of his shadow.

This necessitates the use of a protractor. Each angle in the above table of times and heights is plotted with a protractor off a line AB (Fig. 12), for example AC_1, AC_2, AC_3, etc. A con-



venient number of divisions along any edge of the protractor are taken to represent the observer's height, DE, and this edge of the protractor is moved along at right angles to AB, until DE just fits in between AB and AC_1, AB and AC_2, and all the remaining angles in turn.

Then AE, measured by the same divisions as were used to measure DE, is the length of the observer's shadow at the hours corresponding to the angles BAC_1, BAC_2, etc.

The shadow-lengths can be added to the tables of times and heights given above.

For the sake of this example the observer's height is assumed to be 6 feet.

Hour.	Height of Sun.	Length of Shadows.
5.27 a.m. and 6.33 p.m....	0	—
6 a.m. ,, 6 p.m....	6°	Too long to be of use.
7 a.m. ,, 5 p.m....	17°	20 feet.
8 a.m. ,, 4 p.m....	28½°	11 ,,
9 a.m. ,, 3 p.m....	40°	7 ,,
10 a.m. ,, 2 p.m.	51°	5 ,,
11 a.m. ,, 1 p.m....	62°	3 ,,
Noon	73½°	1 foot 6 inches.

After a little practice, shadow-lengths can be accurately judged while on the march, and the inconvenience of halting and looking into the glare of the sun is avoided.

Bearings by the Sun.

When the sun is on the meridian of a place the time is said to be apparent noon at that place. It must be remembered that only in April, June, the last week in August, the first in September, and the last week in December, is apparent noon the same as mean noon (12 o'clock). For the rest of the year apparent noon may be either before or after 12 o'clock, and may differ by as much as 16 minutes. It is evident that the sun at 12 o'clock may be some degrees from the meridian.

For this reason the sun at 12 noon must never be used for determining the magnetic variation of a compass, although the shadows it throws may well be used as aids to marching on a compass bearing.

Rule II.

A rough rule, which can only be used in high latitudes, where the sun does not rise to a great height in the heavens, is given for finding the direction of true N. and S. with a watch. In N. latitudes point the hour hand to the sun, and the direction of true S. will lie midway between the hour hand and 12. In S. latitudes point 12 to the sun, and the direction of true N. will lie midway between 12 and the hour hand.

The declination of the sun on 21st March and 23rd September is 0. In other words, on those two days, and only on those two days, the sun is on the celestial equator, and will therefore, all the world over, rise due E., follow the celestial equator through the heavens, and set due W.

On every other day the sun rises N. of E. or S. of E., according to the time of year, the amount of its departure from true E. varying with the latitude of the observer.

Table III. gives the departures (from true E. and W.) of the sun at sunrise and sunset on the longest and shortest days of the year, for different latitudes.

Example V.

Required the bearings of the sun at different times of the day on 30th October at Maritzburg.

The latitude is 30° S., the sun's declination $13\frac{1}{2}°$ S.

From Table III. the greatest departure for latitude 30° is 27°.

That is, the departure is 27° for a declination of $23\frac{1}{2}°$.

Therefore the departure is $\frac{27 \times 13\frac{1}{2}°}{23\frac{1}{2}}$ for a declination of $13\frac{1}{2}°$.

That is, the departure is 15°.

The sun's declination is S., therefore the departure is S.

The sun, from Example IV., rises at 5.27 a.m. and sets at 6.33 p.m. It is due N. at noon.

A table of times and bearings can now be made.

Time.	*True bearing of sun.*
5.27 a.m. (sunrise)	105°
6 a.m.	96°
7 a.m.	80°
8 a.m.	64°
9 a.m.	48°
10 a.m.	32°
11 a.m.	16°
Noon	360°
1 p.m.	344°
2 p.m.	328°
3 p.m.	312°
4 p.m.	296°
5 p.m.	280°
6 p.m.	264°
6.33 p.m. (sunset)	255°

From this table it is clear that if an observer has a watch he can obtain bearings at any hour, or if he has a compass he can obtain time. If he has neither watch nor compass he must combine the table of times, heights of sun, and shadow-lengths with the table of times and bearings.

Measuring either the height of the sun or the length of his shadow he will then be able to obtain both time and bearings.

Time by Stars.

Every star is moving in space, some towards the sun, others away from it, but the stars are so far removed from the earth that the fastest moving star will not alter its relative position to the naked eye in less than 25 years.

The principal constellations must be learnt by heart. This is only a question of practice on clear nights with a reading lamp and a good star-chart.

When the constellations have been learnt it is easy to master their movements in the heavens, as their distances from each other and from the celestial equator are always the same.

It has already been mentioned that stars rise 4 minutes earlier every day.

If the time of rising of a star has been recorded on any particular date, and some weeks later the observer's watch is broken, he can obtain his time by the rising of that star.

Rule III.

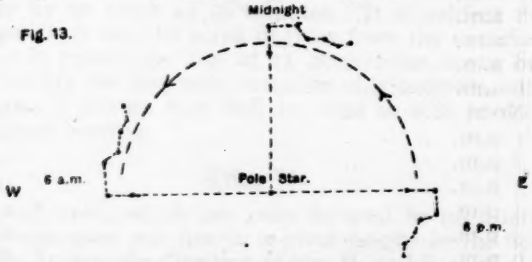
About the end of February the pointers of the Plough are horizontal at 6 p.m., upright at midnight, and horizontal again at 6 a.m. Fig. 13 explains this.

The rule for any date on which the Plough is visible is, Note the angle which the pointers make with a vertical straight edge (such as a stick or pencil) at sunset. When the pointers have swung round 90° six hours will have elapsed.

After a little practice 3 hour intervals (45°) can be estimated, and finally single hour intervals (15°).

Fig. 13 illustrates two 6 hour intervals.

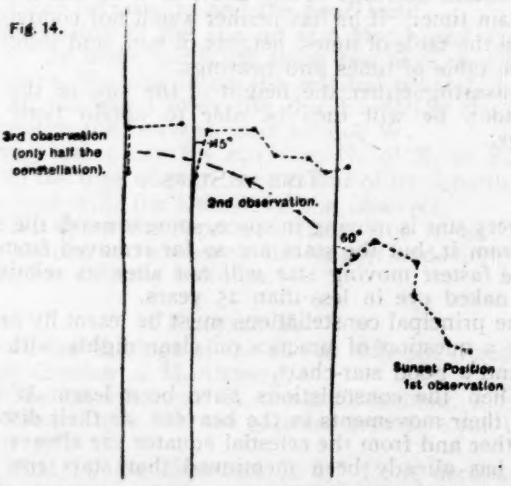
Fig. 13.



Positions of the Plough towards the end of February.

In Fig. 14 the inclination of the pointers at sunset was observed to be 60° to the vertical. When the pointers were

Fig. 14.



At sunset the inclination was estimated to be 60° to the vertical.

At the 2nd observation the inclination was estimated to be 15° to the vertical.

Therefore interval was $\frac{60-15}{15}$ (or 3) hours after sunset.

At the 3rd observation the inclination was estimated to be 0. Therefore the interval was $\frac{60}{15}$ (or 4) hours after sunset.

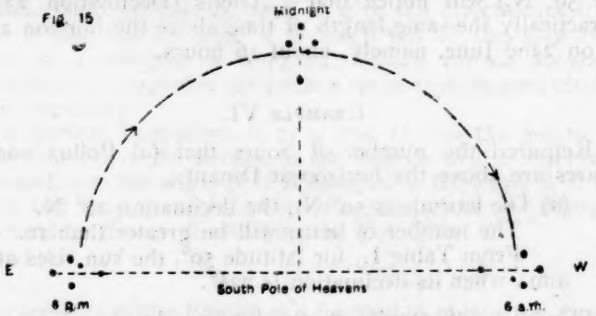
observed again, their inclination was 15° to the vertical. Therefore the time was 3 hours after sunset.

The pointers were again observed some time afterwards, and were found to be upright. The time was therefore 4 hours after sunset.

In S. latitudes the Southern Cross can be used in a similar manner.

At the end of March the Cross is on its side at 6 p.m., upright at midnight, and on its side again at 6 a.m. (Fig. 15.)

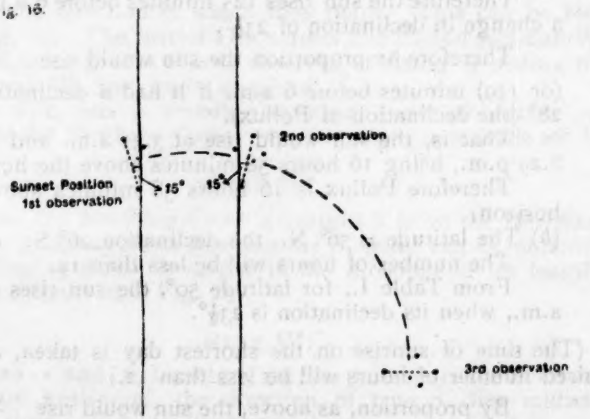
Fig. 15



Positions of the Cross at the end of March.

Rule III. applies again for any date on which the Cross is visible. Fig. 16 illustrates this. The constellation of Orion is very useful to an observer on the equator, as it rises due E.

Fig. 16.



At sunset the inclination was estimated to be 15° to the vertical.

At the 2nd observation the inclination was estimated to be 15° to the vertical

Therefore the interval was $\frac{15+15}{15}$ (or 2) hours after sunset.

At the 3rd observation the inclination was estimated to be 90° to the vertica

Therefore the interval was $\frac{15+90}{15}$ (or 7) hours after sunset.

of him, passes vertically over his head, and sets due W. of him, every hour producing a change of 15° in height.

Stars on or near the celestial equator are 12 hours above the horizon all the world over.

A star that is N. of the celestial equator is more than 12 hours above the horizon to an observer who is N. of the equator, and less than 12 hours above the horizon to an observer who is S. of the equator. For example, an observer at Dinant (Latitude 50° N.) will notice that α Arietis (Declination 23° N.) is practically the same length of time above the horizon as the sun on 22nd June, namely, about 16 hours.

Example VI.

Required the number of hours that (*a*) Pollux and (*b*) Antares are above the horizon at Dinant.

(*a*) The latitude is 50° N., the declination 28° N.

The number of hours will be greater than 12.

From Table I., for latitude 50°, the sun rises at 3.55 a.m., when its declination is $23\frac{1}{2}$°.

(The time of sunrise on the longest day is taken, as the required number of hours will be greater than 12.)

It is known that the sun rises at 6 a.m. when its declination is 0.

Therefore the sun rises 125 minutes before 6 a.m. for a change in declination of $23\frac{1}{2}$°.

Therefore by proportion the sun would rise $\frac{125 \times 28}{23\frac{1}{2}}$ (or 149) minutes before 6 a.m. if it had a declination of 28° (the declination of Pollux).

That is, the sun would rise at 3.31 a.m. and set at 8.29 p.m., being 16 hours 58 minutes above the horizon.

Therefore Pollux is 16 hours 58 minutes above the horizon.

(*b*) The latitude is 50° N., the declination 26° S.

The number of hours will be less than 12.

From Table I., for latitude 50°, the sun rises at 8.5 a.m., when its declination is $23\frac{1}{2}$°.

(The time of sunrise on the shortest day is taken, as the required number of hours will be less than 12.)

By proportion, as above, the sun would rise $\frac{125 \times 26}{23\frac{1}{2}}$ (or 138) minutes after 6 a.m. if it had a declination of 26° (the declination of Antares).

That is, the sun would rise at 8.18 a.m. and set at 3.42 p.m., being 7 hours 24 minutes above the horizon.

Therefore Antares is 7 hours 24 minutes above the horizon.

The number of hours that a star is above the horizon may be a useful thing to know if the time of the star's rising is noted, as midway between its rising and its setting the star will be on the meridian.

Bearings by Stars.

The Pole Star, or Polaris (α Ursae Minoris), is only $1\frac{1}{4}°$ away from the N. pole of the heavens, so that, at any time when it is visible, it may be used to give the direction of true North. It can also be used if a rough test of the magnetic variation of a compass is required, though for an accurate determination of magnetic variation a more complicated observation is necessary.

It is obvious from Figs. 6, 7, 9, and 11 that the height of the Pole Star above the horizon is the latitude of the observer, since in each case the angle N O R is equal to the angle Z O E.

This fact may be useful, when the pointers of the Plough are obscured by clouds, for finding the Pole Star.

Rule IV.

The pointers of the Plough can be used to obtain the direction of true North when the Pole Star is obscured by clouds or below the horizon. When the pointers are upright they are on the meridian. When they are in any other position the N. point can be obtained by spacing 5 times the distance between them in the direction in which they point. This can be seen from Fig. 13. The belt of Orion rises due E. and sets due W. in all latitudes so that if it is observed at rising or setting the true E. and W. line can be obtained.

The Pole Star is invisible anywhere south of latitude 10° N., while the Southern Cross comes into sight in latitude 20° N.

Rule V.

When the Southern Cross is upright it is on the meridian. When it is in any other position the S. point can be obtained by spacing $3\frac{1}{2}$ times its height in the direction of its length. This can be seen from Fig. 15.

Rule VI.

When α and β Centauri, the two pointers to the Southern Cross, are horizontal, the direction of true S. lies midway between them. Fig. 17 illustrates this.

The above are rough rules which are extremely useful. But an observer must not be restricted to a few constellations. He should be able to make use of any bright star in the heavens.

To an observer on the equator all stars rise North or South of true E. the exact amount of their declinations. Capella, for example, rises N.E. and sets N.W.

Roughly, the same rule holds good for any place in the tropics, but to obtain greater accuracy Table V. is given.

Fig. 17

Example VII.

Required the bearings of Arcturus (α Boötis on a night that it is visible at Dinant. The latitude is 50° N., the declination (from Table IV.) is 20° N. The sum is less than 80°.

From Table V. 14° must be added.

Therefore Arcturus rises 34° N. of E., and sets 34° N. of W.

Its height on the meridian (by Rule I.) is 60°.

Example VIII.

Required some stars that might be useful for rough bearings in Maritzburg.

The latitude is 30° S.

From Table V. 2° must be added for every 10° of a star's declination.

Therefore Vega will rise roughly N.E. and set N.W.

Arcturus will rise roughly E.N.E. and set W.N.W.

Sirius will rise roughly E.S.E. and set W.S.W.

and so on.

If the number of hours that each of these stars is above the horizon is calculated, an observer can determine at what length of time after rising each star will be on the meridian.

Example IX.

It is required to march W.S.W. at Fashoda. What stars may be useful?

The latitude is 10° N.

From Tables IV. and V. Sirius sets at 18° S. of W., β Scorpii at 21° S. of W., and Antares at 27° S. of W.

If none of these are in the W. at the time of marching, some known star that is setting must be taken, its bearing calculated, and the march made at the necessary angle to it.

As regards the selection of useful stars on any night of the year, an observer should note at sunset any known star that is near the meridian. From Table VI. he can then see which of the principal stars will be visible during the night.

Time by the Moon.

The moon rises roughly 50 minutes later each day.
The first quarter rises at noon and sets at midnight.
Full moon rises at sunset and sets at sunrise.
The last quarter rises at midnight and sets at noon.
The movement of the moon is too irregular for it to be used for bearings.

Table I.

Times of Sunrise and Sunset on the longest and shortest days of the year for different latitudes.

	Sunrise.	Sunset.
	a.m.	p.m.
Equator	5.58	6.2
	6.2	5.58
Latitude, 10°	5.42	6.18
	6.18	5.42
,, 20°	5.24	6.36
	6.36	5.24
30°	5.2	6.58
	6.58	5.2
,, 40°	4.35	7.25
	7.25	4.35
,, 50°	3.55	8.5
	8.5	3.55
,, 60°	2.45	9.15
	9.15	2.45

The declination of the Sun on these days is $23\frac{1}{2}°$.

In N. latitudes the longest day is 22nd June, the shortest 22nd December.

In S. latitudes the longest day is 22nd December, the shortest 22nd June.

In obtaining the time of Sunrise on any particular day use the earlier time in the above table if the day in question is nearer the longest day of the year, and the later time if the day is nearer the shortest day.

In obtaining the number of hours that a star is above the horizon use the earlier time if the number will be greater than 12, the later if the number will be less than 12.

TABLE II.

Approximate declination of the Sun on the 1st day of each month :—

—	N.	S.
1st January	—	23°
1st February	—	17°
1st March	—	8°
1st April	4°	—
1st May	15°	—
1st June	22°	—
1st July	23°	—
1st August	18°	—
1st September	9°	—
1st October	—	3°
1st November	—	14°
1st December	—	22°

The Sun's declination is 0 on 21st March and 23rd September, and is $23\frac{1}{2}°$ N. on 22nd June and $23\frac{1}{2}°$ S. on 22nd December.

The declination of the Sun on any day other than the 1st of a month must be obtained by interpolation in the above table.

Example. Required the declination of the sun on (*a*) 9th May and (*b*) 25th September.

(*a*) Declination on 1st May is 15° N., and on 1st June is 22° N.

The change in declination is + 7° in 31 days.

Therefore the change in 8 days will be + 2°, and the Sun's declination on 9th May will be 17° N.

(*b*) Declination on 1st September is 9° N., and on 1st October is 3° S.

The change is − 12° in 30 days.

Therefore the change will be − 10° in 24 days, and the Sun's declination on 25th September will be 1° S.

TABLE III.

Departures of the Sun at Sunrise and Sunset on the longest and shortest days of the year for different latitudes :—

Equator	23°	North of E. and W. on June 22nd.
Latitude 10°	24°	
,, 20°	25°	
,, 30°	27°	South of E. and W. on December 22nd.
,, 40°	31°	
,, 50°	38°	
,, 60°	53°	

The declination of the Sun on these days is $23\frac{1}{2}°$.

Table IV.

Declinations of the Principal Stars.

This table is only to be used if the sum of the latitude and declination is less than 80°.

α Ursæ Majoris (Dubhe)	...	62° N.	
δ Ursæ Majoris	...	54° N.	
α Persei	...	50° N.	
η Ursæ Majoris	...	50° N.	
α Aurigæ (Capella)	...	46° N.	
α Cygni (Deneb)	...	45° N.	
β Persei (Algol)	...	41° N.	
α^2Lyræ (Vega)	...	39° N.	
α Geminorum (Castor)	...	32° N.	
β Tauri	...	29° N.	
β Geminorum (Pollux)	...	28° N.	
The Pleiades	...	24° N.	
α Arietis	...	23° N.	
α Boötis (Arcturus)	...	20° N.	
α Tauri (Aldebaran)	...	16° N.	
δ Pegasi (Algenib)	...	15° N.	
α Pegasi (Markab)	...	15° N.	
β Leonis (Denebola)	...	15° N.	
α Leonis (Regulus)	...	12° N.	
α Aquilæ (Altair)	...	9° N.	
α Orionis (Betelgueux)	...	7° N.	
δ Orionis (Bellatrix)	...	6° N.	
α Canis Minoris (Procyon)	..	5° N.	
δ Orionis	...	Equator.	
β Orionis (Rigel)	...	8° S.	
α Virginis (Spica)	...	11° S.	
α Canis Majoris (Sirius)	...	17° S.	
β^1 Scorpii	...	20° S.	
δ Canis Majoris	...	26° S.	
α Scorpii (Antares)	...	26° S.	
ε Canis Majoris	...	29° S.	
α Piscis Australis (Fomalhaut)		30° S.	
α Columbæ	...	34° S.	
ζ Argûs	...	40° S.	
α Phœnicis	...	43° S.	
α Gruis	...	47° S.	
α Argûs (Canopus)	...	53° S.	
β Araæ	...	55° S.	
δ Crucis	...	57° S.	
α Pavonis	...	57° S.	
δ Crucis	...	58° S.	
α Eridani (Achernar)	...	58° S.	
β Crucis	...	59° S.	
η Argûs	...	59° S.	
α^2 Centauri	...	60° S.	
β Centauri	...	60° S.	
α^1 Crucis	...	63° S.	
α Trianguli Australis	...	69° S.	

For Departures. Table V.

In Latitude 10° add 1° for every 20° of star's declination.
" 20° add 1° " 10° " "
" 30° add 2° " 10° " "
" 40° add 4° " 10° " "
" 50° add 7° " 10° " "
" 60° double the declination for stars close to celestial equator.

TABLE VI.

Intervals between Rigel and each of the principal stars on any meridian.

—	Hrs.	Mins.	—	Hrs.	Mins.
β Orionis (Rigel) ...	0	0	η Ursæ Majoris ...	8	34
ϑ Orionis (Bellatrix) ...	0	10	β Centauri	8	47
β Tauri	0	10	α Boötis (Arcturus) ...	9	1
δ Orionis...	0	17	α^2 Centauri	9	23
α Columbæ	0	26	β^1 Scorpii	10	50
α Orionis (Betelgueux)	0	40	α Scorpii (Antares) ...	11	14
α Argûs (Canopus) ...	1	12	α Trianguli Australis ...	11	29
α Canis Majoris (Sirius)	1	31	β Aræ	12	8
ϵ_2 Canis Majoris... ...	1	45	α Lyræ (Vega)	13	24
δ Canis Majoris ...	1	55	α Aquilæ (Altair) ..	14	36
α Geminorum (Castor)	2	19	α Pavonis	15	8
α Canis Minoris... ... (Procyon)	2	24	α Cygni (Deneb) ...	15	28
β Geminorum (Pollux)	2	30	α Gruis	16	52
ζ Argûs	2	50	α Piscis Australis ... (Fomalhaut)	17	42
α Leonis (Regulus) ...	4	53	α Pegasi (Markab) ...	17	50
η Argûs	5	31	ϑ Pegasi (Algenib) ...	18	58
α Ursæ Majoris (Dubhe)	5	48	α Phœnicis	19	12
β Leonis Denebola) ...	6	34	α Eridani (Achernar) ...	20	24
ϑ Ursæ Majoris... ...	6	39	α Arietis	20	52
δ Crucis	7	0	β Persei (Algol) ...	21	52
α Crucis...	7	11	α Persei	22	8
ϑ Crucis	7	16	The Pleiades	22	30
β Crucis	7	32	α Tauri (Aldebaran) ...	23	21
α Virginis (Spica) ...	8	10	α Aurigæ (Capella) ...	24	0

It is clear from the above table that Sirius will cross the meridian 1¼ hours after Rigel, and the Pleiades 1½ hours before Rigel.

Books of Reference:—

"The People's Atlas of the Stars," by Rev. James Gall (*Gall and Inglis*).

"The Story of the Heavens," by Sir Robert Ball (*Cassell and Co.*).

"Astronomy of To-day," by C. C. Dolmage (*Seeley and Co.*).

"Sidelights on Astronomy," by Simon Newcomb (Harpers).

"Scouting and Reconnaissance in Savage Countries," by Captain C. H. Stigand (*Hugh Rees*).

"Hints to Travellers," Royal Geographical Society.

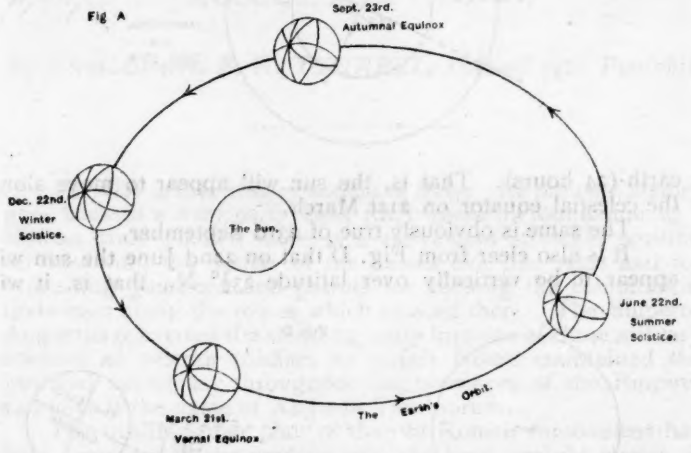
APPENDIX.

THE CAUSE OF THE SUN'S APPARENT ANNUAL SWING.

The sun is the centre of the solar system, and the earth is one of 8 planets that are known to be revolving round it.

The earth revolves once round the sun in 365.256 days, and the orbit of this revolution is not a circle, but an ellipse (Fig. A).

Fig A



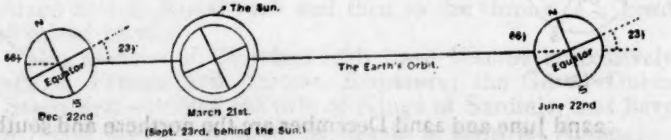
The earth's distance from the sun is constantly changing, but the incidence of the seasons is not due to this change. It is due to the fact that the axis of the earth, round which the earth rotates, is inclined at an angle of $66\frac{1}{2}°$ to the plane of the earth's orbit, or, in other words, that the equator of the earth is inclined at an angle of $23\frac{1}{2}°$ to the plane of the earth's orbit.

Summer in Europe is when the earth is farthest from the sun, because in that position the sun's rays on Europe are nearer the vertical than in any other position of the earth.

Fig. A represents the orbit of the earth round the sun seen from above.

Fig. B represents the same orbit seen from the side.

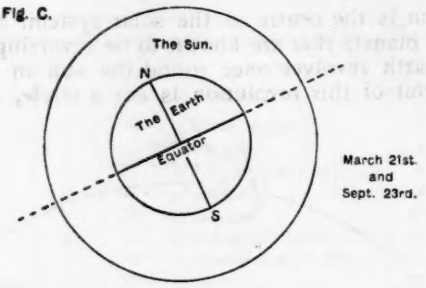
Fig. B.



It is clear from Fig. C (an enlargement of the vernal equinox of Fig. B) that on 21st March the sun is bisected by

the plane of the equator of the earth, and therefore will appear to be vertically over the equator during one rotation of the

Fig. C.

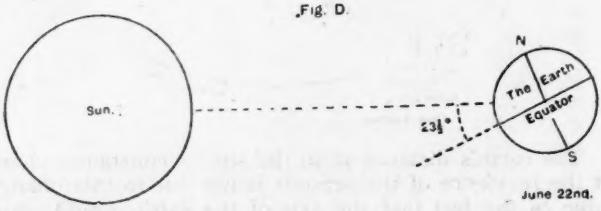


earth (24 hours). That is, the sun will appear to move along the celestial equator on 21st March.

The same is obviously true of 23rd September.

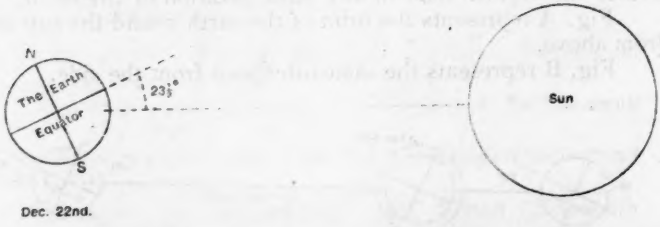
It is also clear from Fig. D that on 22nd June the sun will appear to be vertically over latitude $23\frac{1}{2}°$ N., that is, it will

Fig. D.



appear to move across the heavens at a distance of $23\frac{1}{2}°$ N. from the celestial equator.

Similarly, as shown in Fig. E, on 22nd December the sun will appear to be vertically over latitude $23\frac{1}{2}°$ S.



22nd June and 22nd December are the northern and southern limits of the swing, 21st March and 23rd September the middle points of it.

In any intermediate position of the earth the sun will appear to be between 0 and $23\frac{1}{2}°$ N. or S. of the celestial equator according as the earth is nearer the June or December position.

MILITARY RELICS AND TROPHIES IN THE MUSEUMS OF ITALY.

By Lieut.-General F. H. TYRRELL, Colonel 74th Punjabis.

TURIN is the military capital of Italy. Its military history goes back to a very early date, for it owes its foundation to a Roman camp planted there as a convenient strategic position for observing the outlets of the passes over the Alps and for furnishing garrisons and patrols for keeping the communications open along the routes which crossed them. The Emperor Augustus converted the standing camp into one of those military colonies of veteran soldiers by which Rome maintained the Imperial supremacy throughout the provinces of the Empire, and gave it the name of Augusta Taurinorum.

The quadrangular plan of the old Roman cantonment has been preserved in the modern city, the long straight streets of which intersect each other at right angles, presenting vistas of the open country beyond and the encircling mountains to the gaze of the spectator as through the tube of a telescope. One of its old Roman gateways, and fragments of its towers and walls, are still standing, and are now carefully preserved. After passing successively under the domination of Lombards and Franks, it became in the Middle Ages the capital of the Duchy of Piedmont, and in the fifteenth century came into the hands of the Grand Dukes of Savoy, whose ancient and noble house has contributed so many illustrious captains and so many gallant feats of arms to the military annals of Europe, and has finally raised its chief to the throne of a United Italy. Like the House of Hohenzollern in Germany, the House of Savoy in Italy has, by its prowess in arms, no less than by its political foresight, attained first to Royal rank and then to the throne of a great and united people.

The electors of Brandenburgh have become successively Kings of Prussia and German Emperors; the Grand Dukes of Savoy first assumed the title of Kings of Sardinia, and have now seated themselves upon the throne of Imperial Rome.

The Palace in Turin, which was so long their home, now stands empty, but it is still one of the most splendid of the many royal palaces of Italy. The name of its entrance hall,

still called the "Salles des Suisses," recalls the old days when its royal owners, like most of the rulers of European States, entrusted their personal safety to the guardianship of the mercenary soldiers from the free land of the mountains, whose bravery and fidelity might always be relied on. Shakespeare makes the King of Denmark exclaim: "Where are my Switzers? Let them guard the door!" But he had no authentic historical warrant for the presence of Swiss Guards at the Court of Elsinore, though Swiss sentinels mounted guard at the Tuileries and at the Hague, at the Escorial, as at the Vatican. The Grand Dukes of Savoy had early gained dear-bought experience of the soldierly qualities of the Swiss, and having proved them as enemies, they preferred to have them as auxiliaries, and from the sixteenth century onward they largely employed Swiss mercenaries in their incessant wars.

During the war of the Spanish Succession, our good Queen Anne paid the expenses of a Swiss regiment in the Grand Duke's service, which, accordingly, went by the name of the Queen's Regiment.

The scarlet-clad company of Swiss Halberdiers, which guarded the doors of the Royal Palace at Turin, was raised by the Grand Duke Charles Emmanuel in 1593, and was dissolved just two centuries later when the French Republican armies overran Piedmont and forced the King to seek a refuge in the island of Sardinia. The French General converted this company of Palace Guards into a company of Gendarmerie, for the preservation of good order in the city, and its members continued to perform this useful service in their ornamental livery of scarlet and silver until the company was finally disbanded in 1802. The halberts used by it, with the staves covered with blue velvet, and the crests and monograms of its Grand Ducal and Royal Masters interwoven in the ornamental steel-work of the axe-heads, are preserved in the Royal Armoury, which occupies one wing of the Palace at Turin, and which possesses one of the finest collections of mediæval arms and armour in Europe, collected by successive Princes of the House of Savoy. Its long gallery is tenanted by some twenty equestrian figures in armour ranged along its sides. The horses are extremely well modelled, and are covered with real skins, to procure which the lives of some fine animals were sacrificed by order of the King Victor Emmanuel II., so that their appearance and attitudes are quite lifelike and give the impression of reality. The suits of armour worn by the riders are, in many instances, the work of the famous armourers of Milan, whose skill in the fashioning and embellishing of the harness of war was renowned throughout Europe. One of the most richly-adorned suits of armour here is also one of the most modern, having been made for Don Diego Filippo Guzman, Spanish Viceroy of Milan, in 1635. The steel jambières and sollerets of the previous century are here replaced by long boots of Spanish leather. The figure

of the Cardinal Sforza-Visconti, also of Milan, is a century earlier in date; the rider is armed *cap-a-pie* with closed vizor, and the horse is barded from counter to tail; the armour is finely fashioned and elegantly ornamental, the patterns of the horse-armour being different on the two sides. Several of the figures are arrayed in suits of armour belonging to the famous fighting family of Martinengo, one suit of black armour having been worn by a champion of that family at the siege of Famagosta in Cyprus by the Turks in 1571.

There is a suit of armour, ornamented with engraved fleur-de-lys, conjectured to have belonged to a follower of the Bourbons; and another manufactured by the famous brothers Negroli, of Milan, armourers to the Emperor Charles V., for Captain Valerio Zacchei. The letter accompanying the bill for this suit of armour is extant, dated 1572; it informs the Captain that the helmet and cuirass have been proved with three musket-balls, discharged point blank, and which produced no effect upon them.

One of the most interesting figures is a portrait-figure of Prince Eugene of Savoy in the dress and arms which he wore at the battle of Turin in 1706. He is represented with out-stretched right arm as if pointing the way to victory, wearing a plain three-cornered beaver hat without plume and a steel cuirass over a yellow coat trimmed and ornamented with broad black braid, said to be the uniform coat of an Austrian Field-Marshal of the period, red breeches and high jack-boots. The cuirass has the figure of the Virgin and Child engraved on the left side of the breast, and in several places shews the dents made by musket-balls. The Prince's long black hair flows dishevelled over his shoulders; he rides a white charger, and embroidered flounces cover the long holster-pipes which hold the pistols which Eugene had to defend his life with at least on one occasion in the close combats to which his ardour impelled him. His Field-Marshal's baton, spurs, pistols, and other articles and insignia belonging to him are preserved in a case near by along with arms and weapons of various kinds which have belonged to Princes of the House of Savoy. Among them is an iron mace which belonged to Charles Emmanuel I., and which tradition says was used by the Chevalier Bayard at the famous tournament at Carignan in 1499. Another historical relic is a suit of black armour, found in the hospital at Vercelli, and of which the tradition is that it was worn by a man-at-arms who was wounded in the battle of Pavia in 1525, and was brought from the field of battle to the hospital, where he died.

Opposite to the figure of Prince Eugene is an equestrian figure in a suit of Oriental armour of singular fashion. The tradition that it belonged to the Sultan Muhammad II., the conqueror of Constantinople, seems to have no foundation: the

armour was purchased by the King Charles Albert from a private collector. The armament is much more complete than is usual among Oriental warriors, whose defensive armour generally consists, or consisted, of a helmet and a shirt of chain-mail, sometimes fortified by plates of steel, and steel brassarts. This figure wears the ordinary Oriental form of domed and spiked helmet,[1] but instead of the usual curtain of chain-mail at the back to defend the nape of the neck, the back part of the helmet is prolonged downwards in a steel curtain. The body is protected by a hauberk of chain-mail, fortified by steel plates; the arms, legs, and feet are entirely covered with laminated armour composed of small rectangular plates or bands of steel overlapping each other, and the heels are garnished with spurs consisting of a single spike of steel. The use of spurs is uncommon among Orientals, as their horsemen use instead the sharp inner angle of their shovel-stirrup: spurs are, however, known to them, for Persian historians describing a defeat say that the fugitives "sharpened the spurs of flight."[2]

The horse has a steel chafron, and the high cantle of the saddle and the shovel-stirrups are of steel, and the neck and body of the horse are completely protected with laminated armour of the same pattern as that on the limbs of the rider. The sabre has a Mameluke steel hilt, and a leather scabbard with steel mountings, and is suspended by a red silk cord sword-belt and slings, such as were commonly used by the Turks.[3]

The horseman carries in his right hand a standard of crimson taffety with a broad yellow border much the worse for wear and with verses from the Koran worked upon it: this standard has no connection with the armour of its bearer; it was purchased from the custodian of a Mosque in Constantinople and was probably a Turkish military standard at one time. Another arbitrary addition to the equipment of the rider is a bunch of curly ostrich feathers, dyed red, in the plume-case

[1] The spike was used instead of a crest on the helmets worn by the Persians and other Oriental nations from the earliest times. Its use in Europe only dates from some seventy years back, when the spiked helmet replaced the shako as the head-dress of the Prussian infantry. The Russians soon after adopted it, and other nations have followed suit.

[2] "Mahmez-i gurez tez sachtand." The Persian word for spurs, "mahmez," is used in India for a spur, but is miscalled "momrez" by Anglo-Indians, just as the Persian word "namda," for a felt lining under the saddle, is mis-spelt and mis-pronounced "numnah."

[3] The Turks and Egyptians always used sword-belts of silk cord before the introduction of European fashions into their military equipments. Silk cord sword-belts were worn by officers of the Madras Army with their blue frock-coats prior to the change in uniform in 1856; the cord belts were red for General and Staff Officers, black for Regimental Officers. They were waist-belts with slings, fastened with gilt olivets and gilt swivels.

at the side of his helmet. Orientals never wore curling or drooping feathers for ornament, but only aigrettes or stiff upright plumes; while the opposite fashion prevailed among European nations, who never used the stiff upright plume till it was introduced by the Turks into Hungary, and thence made its way into more western countries.

There are also two figures of men-at-arms on foot in armour described as Saracenic, which have some peculiar features. One of the helmets has a visor, a most uncommon feature in Eastern headgear; the helmet of the other has the usual nasal or nose-guard widened at the lower extremity into a laterally expanding plate to protect the mouth and teeth. On one side of this steel plate is engraved the representation of a musket with a stock of European pattern; on the other side a flower, apparently a thistle. The thistle design is repeated on the plates of steel which reinforce the chain-mail hauberk, and they have also Arabic letters engraved on them. It is difficult to account for this mixture of European and Asiatic emblems: the suits of armour may have been "faked," different pieces being taken from different sets, or they may have belonged to the Turcopoli, soldiers employed under the Knights of Malta who were equipped and armed in the Oriental fashion. There is also a good collection of Oriental armour and weapons of familiar type; Turkish Yataghans, Persian Khanjars (spelt "Kandscher" in the catalogue), Malay Krises, Achinese Klavongs, and Indian swords and daggers in great variety. Among them is one scimitar described as belonging to Tippu Sahib, Sultan of Mysore, which one would hardly expect to find in an Italian armoury; but it was given by the Sultan as a present to General de Boigne, a Savoyard soldier of fortune, who commanded the regular troops in the Maharajah Scindia's army, and who, after his return to his native country, presented the sword to his sovereign, King Charles Albert, who placed it in his royal armoury. It is a finely shaped scimitar blade, with a gold hilt of the ordinary Indian tulwar pattern, round gripe and slender finger-guard; the scabbard is of crimson velvet with gold mountings.

There are two dismounted figures accoutred as a cuirassier and a musketeer of the time of the Thirty-Years' War. The former is an officer with a plume of feathers in his helmet and a lace collar over his cuirass; his doublet is striped red and yellow. The musketeer's is in black and yellow; he also wears a cuirass, and has a black horse-hair plume in his morion. He is equipped with bandoliers, ball-bag, and priming-horn, and holds his clumsy matchlock musket in his right hand, and in his left the staff of his wooden musket-rest, shod and capped with steel.

Another remarkable equestrian figure is that of Duke Emmanuel Philibert of Savoy, General of the armies of the Emperor Charles V., and of his son, Philip II. of Spain,

famous for his great victory at St. Quentin over the French in 1557. The splendid panoply in which he is clad was made by the brothers Negroli of Milan in 1561. Over his armour he wears the blue silk sash which has always been a distinguishing badge of the House of Savoy, which was worn by officers of all arms and all ranks in the Piedmontese Army, and is still similarly worn in the Italian Army on all guard duties and full-dress parades. The old Piedmontese Army, the first formations of which were almost contemporaneous with those of our oldest British regiments at the Restoration of King Charles II., was incorporated in the National Army of the newly-constituted kingdom of Italy in 1861, furnishing the first four cavalry and the first sixteen infantry regiments of the present Italian Army. A coloured print in this Gallery shews the uniforms of the old Piedmontese regiments—blue coatees with facings and lapels of red or yellow. Here also are preserved its trophies—a French standard captured at the Battle of Turin; Spanish colours taken in Italian wars; Austrian flags and the lances of Hulans with black and yellow pennons captured in the wars of 1848 and 1859.

A detailed account of the treasures of this Armoury would easily fill volumes. Here are many examples of the exquisite work of Italian artists of the Renaissance in the decoration of the stocks of arblasts and arquebuses, the blades of swords and daggers, the orbs of bucklers, the panels of powder flasks, and the plates of armour with representations of scenes of war and of the chase, illustrations of stories from Grecian mythology or Old Testament history, or with devices of their own imagination. A bronze buckler with sculptured representations of scenes from the war of the Roman Marius with the Numidian Jugurtha is attributed by tradition to Benvenuto Cellini, but it is not to be found in any of the published lists of his works.

The arms and hunting equipments and many relics of the late Kings Victor Emmanuel II. and Humbert I. are also preserved here, and specimens of weapons and military paraphernalia from all quarters of the globe.

The Maschio della Citadella, an old Reduit, and the only part of the citadel of Turin now left standing, contains the Museo Nazionale d'Artigleria, a collection of cannons and firearms of all descriptions, from the 14th century down to the present time. Here are stone cannon shot fired from Turkish guns at the siege of Otranto; a revolving pistol, which belonged to the Emperor Charles V.; the beak of a Roman galley in the shape of a boar's head, fished up in the harbour of Genoa; British field guns presented to our Sardinian allies in the Crimea; and specimens of all the types of firearms and *armes blanches* used in the Piedmontese Army since its first formation.

"All the warlike gear of old
Mixed with what we now behold."

Outside of this building stands the marble effigy of Pietro Micca, the heroic corporal of Sappers, who on the 30th August, 1706, saved Turin from capture by the French by jumping into the unfinished mine with a match and firing it, blowing himself up along with twelve hundred French Grenadiers of the storming column, which was mounting the breach, "carried, Elijah-like, fire-winged to Heaven."

"The match is flung, the mine is sprung, with one dread thunder roar;
He and twelve hundred foemen shall fight again no more."

An instance of devotion to king and country, not to be surpassed by any Spartan hero of antiquity. The French leaders, Marshal Marsin and the Duc d'Orleans, were so staggered by the catastrophe of the loss of so many of their best men (for the Grenadier companies were at that time composed of the picked men of every battalion) that they hesitated to renew the assault; and in a few days Prince Eugene arrived at the head of an Imperial army to raise the siege, totally defeated the French in a great battle under the walls of Turin, and drove them headlong from the country.

There are other notable statues of a military character adorning the streets and squares of Turin: one by Marochetti in bronze of Duke Emmanuel Philibert, the conqueror of St. Quentin, who is represented in full armour on horseback in the act of sheathing his sword, to signify the accomplishment of peace by his victory. On the sides of the pedestal are sculptures in relief representing the battle of St. Quentin and the ensuing Peace of Cateau-Cambrésis.

Another statue by Marochetti is a bronze one of King Charles Albert, in the Piazza Carlo Alberto, while in the Piazza Solferino is a marble statue of his brother, Duke Ferdinand of Genoa, who is represented as at the battle of Novara, with his horse mortally wounded falling under him.

The picture gallery or Pinacoteca of Turin contains a full length portrait of King Charles Albert in uniform by the much over-rated French military painter, Horace Vernet.

In the same room is a fine canvas by Von Schuppen, representing Prince Eugene on a prancing charger riding over the bodies of slain Turks, whose hoof-beaten bosoms are trod to the plain, their cloven turbans unrolled from their shaven heads, their hands still grasping in death buckler and scimitar. Another room in the gallery is entirely devoted to the battle scenes of Eugene's victories; Hochstett (Blenheim), Ramillies, Turin, and Malplaquet over the French; Zenta, Peterwarudin, and Belgrade over the Turks. The pictures are obscured by age, and many of them are hung in a bad light, so the details are not easily made out. Camels figure prominently in the Turkish battle-scenes, and lines and masses of white turbans mark out the positions of the infidels.

The Museum of the Arsenal at Venice has among its trophies Turkish horsetail standards captured in the wars between the Republic of St. Mark and the great military Musal man Empire on its borders. Against the wall, under a glass case, is displayed the flag of Ali, the brave but unfortunate Capitan Pasha, who commanded the Turkish fleet at Lepanto, and who perished in the wreck of the lost battle. It is a large pennon-shaped flag of red damask, embroidered in gold, with texts from the Koran and with figures of stars, crescents, and the two-bladed sword of the ill-fated Admiral's namesake, Ali, the son-in-law of the Prophet. This famous sword was entitled Zu'l'fikar (Lord of the Cleavings), and as represented in Moslem heraldry, is a quite impossible and amorphous weapon.

The flag looks as good as on the day it was first unfurled, three hundred and forty years ago, and its state is a great contrast to the tattered and faded condition of most of the old standards and colours kept as trophies or relics in European museums and churches; but this memorable Venetian trophy has been kept under glass, which accounts for its satisfactory state of preservation. Charles Dickens mentions it as "a fierce standard, taken from the Turks, drooping in the dull air of its cage."

The Town Museum at Perugia has among its relics of antiquity a Grenadier cap of the seventeenth century. It has a mitre-shaped front of black varnished leather, ornamented with a brass badge of a Dragon, the emblem of Perugia, and a scarlet cloth hood hanging from the back and ending in a tassel. The Grenadier cap was originally an imitation of a Janissary head-dress, and the hood was probably intended to represent the strip of felt which hung down from the back of the Janissary's cap. Tradition accounts for this strip of felt as a remembrance of the sleeve of the Saint Haji Bektash, who stretched out his arm over the heads of the front rank to bless the newly-raised corps on its institution; probably the real *raison d'être* of the strip of felt was to save the back of the wearer's neck from a sabre cut.

The façade of the Royal Palace at Naples is adorned with eight marble statues, representing the eight different dynasties that have ruled over the country since the fall of the Roman Empire; the Norman, the Swabian, the Angevin, the Arragonese, the Spanish, the Spanish-Bourbon, the French, and the Piedmontese. The latter is the only Italian family among the eight, all the other seven commemorate the foreign domination under which Italy lay for a thousand years. These statues are interesting, both from their artistic merit, for they are the work of the best sculptors of modern Italy, and from their historical association; but chiefly from their accurate representation of the military costume of the different ages to which they belong. Roger the Crusading Norman, who conquered Sicily from the Arabs and added Naples to his dominions about the

same time that his brethren conquered the Saxon kingdom of England, is shown in his flat-topped helmet and shirt of mail, grasping his long two-handed sword. Frederick of Hohenstaufen, who succeeded by marriage to the inheritance of the Normans, wears a helmet surmounted by an eagle with outstretched wings, like that of the German Kaiser's Bodyguard at the present day. Charles of Anjou, who extirpated the Germans and reigned in their stead, wears a long surcoat over his mail; the Neapolitans were always ready to welcome a change of rulers, but they only changed an old tyranny for a new and more galling yoke; and the Sicilian vespers, which put an end to the French rule, brought in the Spaniards in their stead.

Alfonso of Arragon wears plate-armour with pauldrons and brassarts of steel; his dominions passed by marriage to the crown of Spain, and the next figure is that of the Emperor Charles V. in the complete panoply of the tournament, save that his head is bare, and he grasps a truncheon in his hand. Naples and Sicily were ruled for two centuries by Spanish Viceroys, till in the division of spoils after the war of the Spanish Succession, they fell to the share of Austria; but Charles of Bourbon reconquered them while the Austrians were engaged with the French upon the Rhine, and made himself King of the two Sicilies. By his time the steel armour has been molten to silken embroidery; but he still wears a cuirass girt with a broad sash under his wide-skirted coat, and the universal three-cornered hat and high jack boots of the military costume of his time. His successors were expelled from Naples by the French Republicans, but maintained their state and authority in Sicily under the protection of a British fleet and army.

The innkeeper's son and dashing cavalry leader, who replaced them on the throne of Naples under the title of Gioacchino Napoleone (Joachim Napoleon), is shown in a theatrical attitude (his subjects called him the Re di Scena, or Stage King), dressed in a General's uniform, his cocked hat surmounted with the famous snow-white plume, his martial cloak thrown over one shoulder, and his cavalry sabre at his side. The last of the series is Victor Emmanuel II., of the conquering House of Savoy, il Re Galantuomo, dressed in the baggy garments of French military fashions under the second Empire, and raising his eyes and his sword to Heaven, as if appealing to the fortune that favours the brave. Under his shadow the Italian Bersaglieri stand sentinel at the gateway once guarded by the Bourbon monarch's Swiss Grenadiers.

The Spolia Opima of the dispossessed dynasty are preserved in the modern Museum of San Martino, under the wing of the old Spanish fortress of St. Elmo, which looks down from its commanding height upon the city of Naples spread out below. The pious brethren who made the adornment and embellishment of their glorious church a labour of love for so

many centuries have been banished like the dynasty which cherished them; their beautiful church is preserved as a national monument for the gratification of the lust of the eye of the spectator and the tourist, and the spacious buildings of the cloistered monastery that was their home are converted to the uses of a National Museum. One of its rooms contains models of the defences of Gaeta and of other fortresses of the Kingdom, and on the walls of another room are a series of plates showing the uniforms of all the regiments of the newly-raised Neapolitan army of King Charles III.,[1] the founder of the Spanish Bourbon dynasty of Naples. The soldiers wear the comfortable and serviceable dress of the first half of the eighteenth century: three-cocked hats, roomy and wide-skirted coats, and long flapped waistcoats with plenty of pockets (not sewn up to prevent their use, as has been done in more recent times by a modern War Office), and long spatterdashes covering the knee and gartered below it. A broad shoulder belt supports the pouch, and a waistbelt carries the sword and bayonet-scabbard. A second series of coloured plates of more artistic merit represents the dress and equipment of the same regiments in the reign of Ferdinand IV., fifty years later in tight coatees, cross-belts, short waistcoats and short black gaiters. Only one regiment of horse is depicted, and sixteen regiments of foot, of which four are Swiss, one Walloon, one Macedonian, and the rest native Neapolitan. The Swiss wear red coats, the Neapolitan Guards and Royal Regiments blue, the Regiments of the Line white uniforms. The Macedonian regiment has a semi-Oriental dress of loose coat and knickerbockers, and a sheepskin busby. This regiment was recruited from Albanian refugees in Italy and from other races of the Christian population on the neighbouring coasts of the Turkish Empire.

This royal Neapolitan Army was dissolved on the occupation of the country by the French Revolutionary Army, and the proclamation of the Parthenopean Republic. When Joachim Murat was made King of Naples by Napoleon he introduced the French system of conscription into his kingdom, and laboured hard to create an efficient National Army; but with the old King and his allies close at hand in Sicily it was not thought safe to rely solely on the services of native troops, and a considerable French force always remained to garrison the country. The pictures of the uniforms of the regiments of Murat's army occupy the wall opposite to those of King Ferdinand. Bear-skin caps and broad-topped shakos have replaced the cocked hats; the coats and jackets are white, with facings of various colours; the pattern and details of dress follow closely those of the French Army. The Royal Guards wear the same uniform as the Grenadiers of the Imperial Old Guard, but with the

[1] This Prince, who was a son of the King of Spain and first King of Naples, called himself the Third, because he reckoned the Kings of Spain as having been also Kings of Naples before him.

colours reversed, white coats with blue lapels instead of blue coats with white lapels. Murat's army was also naturally strong in cavalry regiments of cuirassiers, lancers and hussars in brilliant uniforms, in some of which he is himself dressed in the portraits here preserved, with many other relics of himself and of the Bonaparte family, in this Museum. There are two huge canvasses which were painted to his order to commemorate the capture of Capri from the English.

The so-called impregnable island had been captured from the French by Sir Sidney Smith in 1806, and the British hoped to make it into a second Gibraltar. Joseph Bonaparte had been braved in his palace at Naples by the sight of the British flag flying over Capri, but Murat was a man of different metal. As soon as he had come to the throne in 1809 he made preparations for re-capturing Capri. He collected flotillas of galleys and feluccas to convey his troops at Pozzuoli, north of Naples, and at Castellamare and Salerno south of it; and by a false report that these preparations were intended for an attack on the islands of Ponza, he succeeded in luring away the English ships from their station before Capri.

No sooner were they out of sight than he embarked his troops; the divisions from Castellamare and Salerno made false attacks on the Grande and the Piccola Marina, the two harbours of the island, while the main attack from Pozzuoli was directed to a solitary and precipitous point of the coast on Anacapri at the northern end of the island. There were no British troops in Capri. The Governor was Sir Hudson Lowe, and the garrison consisted of two foreign regiments, the Corsican Rangers and the Maltese Infantry; the former were good troops, but the latter were of doubtful quality. The British authorities probably did not care to risk any of their own soldiers in such an exposed situation; and, like the Blue-water school in England to-day, they trusted to the Navy for the security of the island.

The French effected a landing by means of ladders planted from the boats against the cliffs: a battalion of Maltese which was hurried to the spot to oppose their landing was surrounded and made prisoners to the number of 800 men; but two companies of the Corsican Rangers who were in Anacapri managed to conceal themselves until nightfall, and then cleverly effected their escape. The rocky stairway which was the only communication between the two parts of the island was already in possession of the French, but Captain Church[1] and his men

[1] By a coincidence a Corsican regiment in the service of France formed part of the invading force. Captain (afterwards Sir Richard) Church took service with King Ferdinand after the peace of 1815, and became a General in the Neapolitan Army. He subsequently commanded a Greek Army against the Turks in the War of Liberation, and on its termination continued to reside in Greece, where he died at a good old age full of years and honours.

aided by their dark rifle uniforms and their knowledge of the French language, managed to pass through the French lines, and making their perilous way over the precipitous face of the cliffs, rejoined their comrades in Capri with the loss of only one man, who missed his footing in the descent and was dashed to pieces by his fall.

The French force besieged Sir Hudson Lowe in the town of Capri. Murat threw reinforcements and a siege-train into the island, and the French were preparing to storm when the Governor, seeing no hope of a successful resistance with his diminished force, hung out the white flag, and obtained an honourable capitulation. The ink of his signature to it was scarcely dry when the British fleet re-appeared off the island, but Sir Hudson Lowe decided that military honour constrained him to fulfil the engagements which he had entered into, and the garrison, with arms, stores and baggage, was embarked on board the British ships for Sicily, while the French took possession of the island.

The first of the two large oil-paintings which commemorate this triumph of the French arms shews Murat superintending the despatch of the expedition: he and his staff occupy the foreground of the picture; below them the French troops are seen embarking in the boats.

Murat is represented pointing out to them the isle of Capri in the distance; he wears a scarlet square Polish cap or czapka with a tall white ostrich-plume; his long black hair falls in ringlets over his shoulders; he is clad in a long purple tunic like an ancient Roman's, with white pantaloons and yellow knee-boots. His staff wear high-crowned cocked hats and blue uniforms with gold oak-leaf embroidery, and a cherubic aide-de-camp is arrayed in a hussar uniform of white and crimson.[1]

The second canvas shows the French soldiers climbing the cliffs of Anacapri from the ladders planted in the boats: on the heights above are seen the red coats of the Maltese infantry.

The capture of Capri was a solitary triumph of the French over the British arms; the luck that had attended the enterprise deserted Murat in his attempt upon Sicily. The silver streak between Reggio and Messina proved an insurmountable obstacle to the French arms. Once, taking advantage of a temporary absence of the British fleet, a Division of French troops was ferried across the straits: two battalions had already been disembarked on the Sicilian shore when some British ships hove in sight; the French ships immediately cut their cables and made the best of their way back to the shelter of the Italian coast, leaving the two battalions to their fate, and they were

[1] Napoleon's Marshals were accustomed to dress the officers of their personal staffs in brilliant uniforms of their own devising. Berthier and Murat in particular excelled in their inventions in the matter of military millinery and martial finery.

made prisoners by the English without resistance. The attempt was never renewed.

An oil painting in the Museo Gaetano Filangieri at Naples depicts King Joachim Murat rescuing the Neapolitan General Filangieri, who has been struck down wounded in an encounter with the Austrians. The King has dismounted from his white charger to succour the fallen General, who is supported in the arms of the Royal Grenadiers. Murat is dressed in the blue uniform of a General Officer with the famous snow-white plume in his cocked hat, and the same white pantaloons and yellow boots. This museum also contains a very fine collection of foreign and mediæval arms and armour made by the Filangieri family, whose name is well known in the military and political history of Naples, and bequeathed by them to their native city.

Among the military pictures in the museum of San Martino is an oil painting depicting the closing scene of the three days' Battle of the Nations at Leipzig in 1813. Prince Schwarzenberg, Generalissimo of the Allied Armies, is presenting to the allied Sovereigns the French standards and colours captured in the battle. The three monarchs are on foot, the Emperor Francis of Austria in the centre with the Czar Alexander of Russia on his right and King Frederick of Prussia on his left hand. All three wear the huge cocked hats in vogue at the time. The Czar wears a green uniform with white leather breeches and jack-boots; the Emperor of Austria a white coat and red trousers; the King of Prussia is in blue, with the grey overalls buttoning down the outer seams at that time worn by the Prussian cavalry. Prince Schwarzenberg, in the white and scarlet uniform of an Austrian Field-Marshal, rides up on his black charger and salutes the sovereigns with his sword, while the captured tricolour flags are borne behind him by their captors. The picture is probably a copy painted from the original for the King of Naples. The British Army was represented at the Battle of the Nations by a rocket-troop of the Royal Horse Artillery.

This Museum also contains arms, equipments and accoutrements of the Neapolitur at various periods, and among these is the modern costume of a Knight of Malta, a scarlet coatee with gold lace and buttons, white cashmere trousers with a gold lace stripe, and a blue scarf with the emblems of our Lord's Passion embroidered on it in gold. There are also many modern pictures of scenes in the "Risorgimento" or Resurrection of Italy, and paintings depicting the combats and battles in the wars of Liberation in 1848-49 and 1859-61.

THE FIGHTING VALUE OF MODERN CAVALRY.

By C. VON HUTIER.

(Translated from the *Militär Wochenblatt* (II) 1909).

Contributed by the General Staff.

THE weapons of a field army are infantry, artillery and cavalry. They must be so fashioned in peace time that they can perform the tasks required of them in war, and thus prove themselves serviceable weapons in the hands of the commander.

In great battles, when both sides are struggling for existence, each will endeavour to destroy the opposing infantry, for it is on the infantry that the destiny of the army depends. The task of overpowering the infantry falls naturally to the infantry, which must assume the offensive to achieve its object. Great as is the power which modern fire-arms confer on their defensive, it is not sufficient by itself to crush the opposing infantry; the artillery and cavalry must therefore support their own infantry to the utmost of their ability; this is the highest duty of these two arms—in fact it is the guiding principle of their action in the attack. In the defence, the infantry does not require their support to the same extent, for it is capable, by its own efforts, of keeping the attacking infantry at arms length. The chief duty of the artillery and cavalry in the defence is, therefore, to restrict the offensive power of the enemy's artillery and cavalry as much as possible.

I discussed the fighting value of infantry and artillery in Nos. 68 and 131, 1909, of the *Militär Wochenblatt*. I will now make a few remarks on the value of modern cavalry in battle.

I will first ask you to look back to the days long gone by —when firearms had not yet begun to restrict the action of cavalry, so that horsemen were in a position to win the highest honours. In those days, when firearms were still primitive, when ranges were short and aim uncertain; when loading was a tedious operation, and battlefields were veiled in smoke; when appliances for observing movements at a distance were few and imperfect; when campaigns were only carried on in the temperate seasons; when horses could be fed from the resources of the country. In those days cavalry was indeed a marvellous weapon of offence, capable of successfully engaging troops no matter of what arm—a weapon that could be used everywhere,

even against the enemy's front. Masses of cavalry could halt or manœuvre close in front of the hostile line, undisturbed by fire, and, when the right moment had come, hurl themselves on the enemy with their horses still comparatively fresh.

Owing to the small size of battlefields, and the primitive nature of firearms, only a few hundred yards had to be traversed at the highest speed during the charge, and the horses were therefore still fit for further enterprises. Again, the absence of good telescopes enabled cavalry to appear unexpectedly and effect surprises. If two hostile bodies of cavalry encountered each other, the weaker was bound to give way—assuming the conditions of ground and efficiency equal for both sides—as there were then no firearms to compensate for numerical inferiority.

The cavalry of Frederick the Great was thus a powerful weapon of offence, although it entered the lists armed only with the *arme blanche*. Every Prussian cavalry soldier was aware of his power, and this assurance formed an incentive to action. This striving for achievement, combined with energy and speed in manœuvre, were the characteristic features of the cavalry of the period of the Great King. Since that day the offensive power and fighting value of cavalry have materially diminished.

A bold cavalry spirit has indeed descended to our present cavalry, but now that the infantry soldier can fire at least six times as many well-aimed shots as formerly, without any tedious adjustment of the sights; now that the range of a rifle bullet runs into thousands of yards, and no smoke obscures the battlefield, the cavalry will not find it so easy to get at the infantry with the *arme blanche*.

The chance of success in attacking the enemy's fire positions is extremely small, while the employment of cavalry against the front of the hostile firing line is practically impossible. The result is that the field of action for modern cavalry now lies rather towards the flanks and rear of the enemy than in his front. But even here there is little opportunity for the use of the *arme blanche*; for there are abundant means for discovering, observing, and frustrating the enterprises of hostile cavalry. Surprise attacks are almost out of the question. They may sometimes succeed, in small operations, under exceptionally favourable conditions of ground and situation, but even so they will contribute little to the fate of the battle: the successes gained will be of a temporary nature. Large masses of cavalry capable of seriously damaging portions of the enemy's forces, can scarcely ever expect to approach the enemy without giving warning; all that such masses can nowadays do is to keep well out of range of the enemy's fire positions; when on the move they must either make considerable detours, or else—if they have to cross the hostile fire zone—increase their pace in a way that must tell on their horses. If they attack, the charge has to be commenced many hundred yards from the objective; and even when they are moving at their highest speed a hail of

bullets will thin their ranks, for—as mentioned above—modern firearms allow of a rapid, well-aimed fire, and there is no smoke to obscure the battlefield. Finally, any cavalry which succeeds in riding its exhausted horses into the enemy's ranks will fail to achieve anything, beside being rendered useless for subsequent enterprises.

It is only when the hostile infantry is either weaker in numbers, or else absolutely demoralized, that cavalry will still be able to reap successes with the *arme blanche, i.e.*, by charging. In the former case it is an open question whether the losses which cavalry will incur in attacking even a weak enemy are sufficient compensation for the success gained. A cavalry soldier is a more expensive item than an infantryman, and even if the infantry is completely annihilated, the losses of the victorious cavalry will always be higher than those of the enemy, provided that the latter, though weaker in numbers, is composed of good troops. The sacrifices entailed by charging infantry—however inferior in numbers to the cavalry—require, therefore, to be carefully weighed. Nevertheless, a cavalry charge is always justifiable, no matter what sacrifices are entailed, provided that it affords the best means of attaining the object in view.

Now modern cavalry should not be content with merely gathering the blood-stained laurels when the enemy's strength has been shaken by the infantry and artillery. The cavalry must be able to pluck the laurels while they are still green; in other words, it must be able to defeat the enemy unaided. But for this its present armament is inadequate. Neither the *arme blanche* nor the carbine are a fitting match for the infantry weapons. In fact, the continued development of firearms has so greatly diminished the fighting value of cavalry that it now requires the support of artillery or machine guns for any enterprises which offer a real prospect of success.

Now this allotment of artillery and machine guns to cavalry usually takes place at the expense of the troops in the main front of the battle. This sacrifice is especially costly to the attacker, for every gun withdrawn from the attack diminishes the possibility of breaking the resistance of the enemy's infantry, since the entire strength of the attacker's artillery will rarely be sufficient by itself to shake the whole front even of a numerically weaker opponent.

If one knew *for certain* that the batteries detached with the cavalry would contribute to shaking the enemy, one would gladly spare them, or even a larger number of guns. Operations of this sort with cavalry and artillery are, however, usually directed against the enemy's flanks and rear; these outflanking manœuvres are doubtful enterprises, depending largely on the ground and the action of the enemy. Thus it happens that the guns allotted to the cavalry are sacrificed for a remote chance, when they could have been made use of for a definite purpose on the field of battle. This does not apply to machine guns, which can be more easily spared by the attacker, because their

fire cannot reach the enemy's reserves, while they are only of use against visible targets, and are bound to expose themselves to the direct fire of the enemy.

For the defender both weapons are of equal value. He requires his guns to weaken the attacker's artillery—which is usually the stronger—so that the enemy may have as few guns as possible available at the end of the artillery duel, to shake his infantry. The defender will not, therefore, willingly detach guns with his cavalry; nor can he easily spare machine guns, which offer an excellent means of strengthening his flanks and the weak points in his front.

The experiment has already been made of attaching infantry cyclists to cavalry so as to increase its fighting strength. This plan was found to be impracticable because the cyclists could not follow the cavalry everywhere. In the French manœuvres this year (1909) infantry were even attached to the cavalry, a striking proof how little reliance can be placed on cavalry unassisted by any other arm. Heavily laden infantry were thus expected at the end of a long day's march to assist the action of the less severely tried cavalry.

In order to compensate for the diminution of fighting power which the cavalry has suffered by the development of the infantry rifle, the carbine has been greatly improved, and the new pattern is an efficient weapon. Still even with this weapon—which is excellent in itself—the fighting power of cavalry cannot be considered satisfactory. For when acting on the offensive against infantry—whose destruction is after all the principal object of the battle—the cavalry can only expect to achieve anything with the carbine when it can open fire by surprise. How seldom will such opportunities occur!

The carbine can only come into play against artillery when the protection of this arm has been neglected. The latest pattern carbines are almost equal in capacity to the infantry rifle. Given equal conditions of tactical and musketry training, cavalry should, therefore, be able to fight infantry almost on even terms. But this is not enough. Even if the carbine were equal to the rifle I would still consider it an unsuitable weapon for cavalry.

In my opinion the cavalry should have a weapon superior both to the infantry rifle and the machine gun. Otherwise it will only become mounted infantry; and modern cavalry must be something more.

Such a cavalry rifle would need in the first place to have a longer range than the infantry rifle; it would, of course, be heavier than the rifle, which weighs some eight pounds; that would not matter, for—even if the cavalry rifle weighed two pounds more—it would still be lighter than the old needle rifle, which weighed eleven pounds. And yet that weapon used to be handled with ease, even when the soldier's movements were hampered by his knapsack. The cavalry soldier would feel the extra weight less than the infantry soldier, since the former is carried, together with his kit, by his horse; and when he dis-

mounts to fight he has only the weight of his rifle and ammunition; otherwise he is unencumbered. Hence the cavalry soldier goes into action fresher, and with greater freedom of action than the infantry soldier. Why then, with all this in his favour, should he not make full use of a firearm weighing some ten pounds?

If the cavalry had a firearm superior to the infantry rifle it would gain enormously in offensive power. Its fighting value would not be dependent on the artillery, etc., attached to it. It could be used in any part of the battlefield, and would be able to shake the enemy's infantry by its own unaided fire—an important consideration. Surely this is really the chief task for any arm! All arms are only means to an end on the battlefield, but the field of action of the artillery lies chiefly in the front of the main action, that of the cavalry on the flanks and rear of the enemy; and the cavalry would be able to reach this field of action all the quicker if it did not have a train of artillery and machine guns dragging behind it.

If the cavalry had a long range rifle it could shake the enemy's reserves by fire from a distance, without itself being exposed to the enemy's fire; or, if required, it could carry out a regular offensive attack, unaided, with a good prospect of success in the fire fight.

Again, in all cases where cavalry finds itself compelled to avoid a decision, *e.g.*, when opposed to stronger bodies of cavalry, when covering a retreat, etc., a long range rifle would be of far more use than the present carbine. This would be the case even against artillery. Cavalry would be a useful means for destroying machine guns, thanks to the long range of its rifle.

Finally, in winter, when snow, ice, and frozen soil restrict the action of cavalry, and render it incapable of reaching its field of action, *i.e.*, the flanks and rear of the enemy; when, with its present inadequate firearm, it can only be used on the defensive; when the endurance of the horses is weakened by want of good food and stabling, cavalry is—with its present armament—likely to become a drag on the offensive. No one is particularly anxious to have it. But if we were armed with a rifle superior to the infantry weapon it would be welcomed as a valuable acquisition by everybody, even in winter.

I must not omit to mention that an increased offensive power would be of great assistance when reconnoitring.

With a long range rifle cavalry would regain the power of independent and energetic action.

The cavalry spirit would not suffer by attaching greater importance to the firearm than to the *arme blanche*, and as a matter of principle, it can make no difference with which arm the cavalry achieves its triumphs. It is only the result that matters.[1]

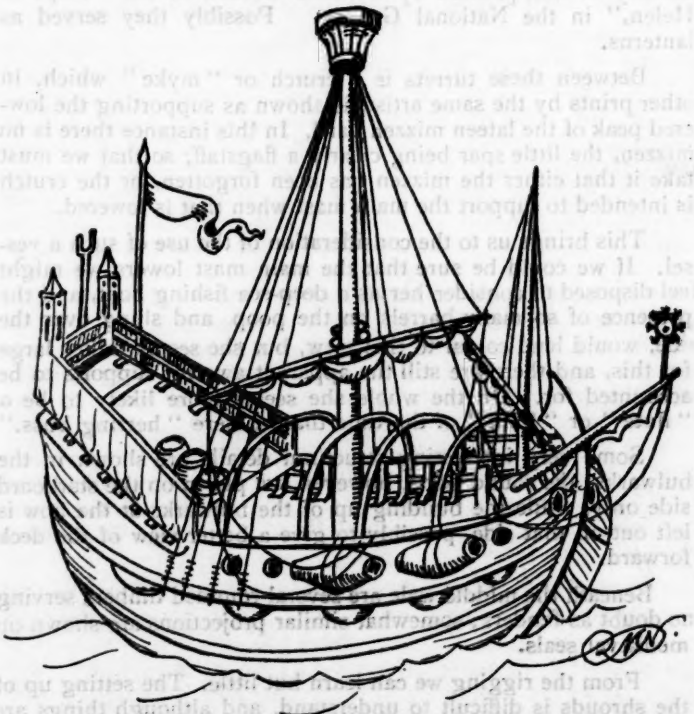
[1] The views of the author will probably evoke much opposition; nevertheless, they may be of interest to our readers.—*Editors, "Militär Wochenblatt."*

The following articles are, by agreement with the Society for Nautical Research, reproduced from the current number of "The Mariner's Mirror."

A FIFTEENTH CENTURY TRADER

By R. Morton Nance.

THE FACT that an artist, working during the last quarter of the fifteenth century, held ships to be in themselves subjects worthy of his skill, would give all his ship pictures an unusual interest. Such an artist was the Fleming who is known to us only by his signature "W.A.," and among his productions is the curious print of which a rough copy is here given. A copy of this print is in the nautical collection at South Kensington; but, as it is skied ina dark and inaccessible corner, and is not catalogued, it can hardly be said to be exhibited.



At first sight the ship seems so strange as to be incredible but on further examination one is disposed to take her as a serious attempt to show the distinctive features of some actual vessel.

Perhaps the first thing to strike us will be the absence of a forecastle, which allows us to see the bowsprit stepped into a chock on deck, beside a very strongly curving stem-head, much as we find these features in the hoys and other small craft of a later date. The bowsprit is decorated above with a foreshadowing of the spritsail topmast, here serving only to raise the hoop adorned with fleurs-de-lis, which may have been a mark to distinguish the service of the vessel, as were the armillary spheres, borne in the same place by East India ships of the following century. The fitting beneath the bowsprit, if not mere ornament, may have served as a lead for the fore-tacks, as did the comb beneath the beak in ships of a later date.

The poop is raised above the stern by stanchions, leaving a free passage for air and light between them, a feature more clearly shown in other contemporary drawings. Turrets such as those shown may be seen also in other fifteenth century ships, and notably in that painted by Benozzo Gozzoli in his "Rape of Helen," in the National Gallery. Possibly they served as lanterns.

Between these turrets is a crutch or "myke" which, in other prints by the same artist, is shown as supporting the lowered peak of the lateen mizzen yard. In this instance there is no mizzen, the little spar being clearly a flagstaff, so that we must take it that either the mizzen has been forgotten, or the crutch is intended to support the main mast when that is lowered.

This brings us to the consideration of the use of such a vessel. If we could be sure that the main mast lowers we might feel disposed to consider her as a deep-sea fishing boat, and the presence of so many barrels on the poop and slung over the side, would lend colour to this view, but she seems rather large for this, and there are still the apparent awning supports to be accounted for. On the whole she seems more likely to be a "flute" or "hulk" of the time than a mere "herring buss."

Some very interesting structural details are shown in the bulwarks; the round ports, however, are put in on the starboard side only, while the building up of the bulwarks at the bow is left out on that side, possibly to give a better view of the deck forward.

Beneath the middle wale are several rounded timbers serving no doubt as fenders; somewhat similar projections are shown on mediæval seals.

From the rigging we can learn but little. The setting up of the shrouds is difficult to understand, and although things are not glaringly wrong in the rig all is sketchy. This is the more remarkable, inasmuch as the plate that "W.A." has left us of a "Kraek" or carrack is the most complete and convincing record

of the rigging of his time to be found. In other respects also this carrack is very different, being engraved probably, from a drawing by a different hand from that responsible for the present print.

It is to be hoped that it will prove possible to give reproductions of all these designs in some future number, but meanwhile those whose interest is aroused in this nameless Flemish artist will find the print here illustrated framed and hung on the wall in the ship model department of the Victoria and Albert Museum. Another may be seen in the print-room at the British Museum, and two more are reproduced, from originals in the Bibliothéque Nationale at Paris, by De la Ronciere in his "Histore de la Marine Française." It would be interesting to know of any other existing work of this old-time ship lover.

DECAEN AND LINOIS.

By JOHN LEYLAND.

ARCHÆOLOGY, being the handmaid of History, may reasonably take account of minor circumstances which illustrate the flow of the historical stream. From this point of view the present article is written. Readers of naval history are aware of the unsatisfactory relations that existed between Rooke and Marlborough, Byng and Blakeney, Vernon and Wentworth, and other naval and military commanders, and they know how fruitful of good results was the better understanding of Boscawen with Amherst and Wolfe, and of St. Vincent with Monckton and Grey. Here it is intended to throw some light upon the relations between the French naval and military services in the time of the First Consul, by describing certain incidents arising from the passage of General Decaen to Pondicherry and the Ile de France in 1803.

In the previous year, when Decaen was an inspecting general of infantry, he proceeded to Toulon, where he had a heated discussion with Rear-Admiral Emmeriau, on the subject of the arrogant attitude which, he said, naval officers adopted in their dealings with officers of the army. On this subject he communicated with the Minister of War, and being dissatisfied with the results of a decision arrived at between the latter and Decrès, Minister of Marine, he reserved to himself the opportunity of discussing the matter with the First Consul on returning to Paris. He appears to have been refused admission to the arsenal at Toulon, and Decrès, who received him very coldly, said he had not presented himself in uniform. This he had denied, declaring that it was not his custom to lie. The treaty of Amiens had been signed, and Decaen was appointed Captain-General of the French establishments in India, and was directed to proceed with an expeditionary force to Pondicherry, to take over the possessions which were to be given up by the British under the terms of the Treaty. Decaen's own account of the proceedings will be found set forth in detail in the second volume of Lieut.-Colonel Ernest Picard's "Mémoires et Journaux du Général Decaen" (Plon-Nourrit, 1911).

The expedition was to consist of the *Marengo*, 74, bearing the flag of Rear-Admiral Linois, the frigates *Belle Poule*, *Atalante*, and *Sémillante*, with the flûte *Nécessité*, and some transports, but Decrès substituted for the flûte a cramped merchantman named the *Côte-d'Or*. This circumstance led to an altercation with the Minister, and an appeal to Bonaparte. The troops, with functionaries, women, children, and others, ga a total of 1,400 persons, but a battalion of 600 blacks and mul os was added, to be formed at Brest out of a body of some 1,500

sent by Richepanse from Guadeloupe. When Decaen met Linois at Brest, antipathy, and even hostility, was soon revealed between the two officers. We know from Colonel Picard's book what the General thought of the Admiral, but not what the Admiral thought of the General. Decrès had indicated a niggardly course of action to Linois. He was not to allow to Decaen the accommodation which had been provided for other captains-general, and especially to Leclerc. Too much money had been expended in luxury. This arrangement profoundly dissatisfied the General, who had with him his wife and one of her sisters, besides a brother and brother-in-law. He was obliged to buy at Brest bedding, furniture, linen, and table requisites and utensils.

At a meeting at the naval prefecture, Decaen told Caffarelli, the prefect, that rather than occupy the unworthy accommodation offered in the *Marengo*, he would go with his family on board the despised *Côte-d'Or*. Linois, who was present, said the regulations provided that in a flagship, the captain must give up his own cabin, which was the first on the starboard side, and must accupy the first cabin on the larboard side, giving the place of honour to the Admiral. To which Decaen replied that, as he had himself some pretension to the most important position on board, they could not well contest his right to be second. "However, I have decided," he said, "to embark in the *Côte d'Or*, and leave you to the plenitude of your regulations and your vessel!" This proposal horrified Caffarelli, who said it could not possibly be permitted, and it was finally decided that the General should have the Captain's cabin on the larboard, and such other cabins as he required on the same side, and as to the great cabin, if he was not prepared to share it with the Admiral, a partition could be placed down the middle. This latter arrangement was evidently not carried out.

Finally, the squadron put to sea on the 5th March, 1803, in a lively breeze, and Decaen says that most of the naval officers, and the greater part of the crew, were sea-sick, and that Linois and Captain Larue could not leave their beds for twenty-four hours. Decaen curiously attributes his own immunity to the care he bestowed on his wife, his lively occupation of fixing in their places things that were liable to roll about, and the fact that he frequently went on deck to see what was going forward. He derides Linois as "our *chef de pension*," who provided a miserable table through extreme avarice, though he had received a considerable allowance. A thin little Breton cow and some infirm poultry had not survived their first experience of the sea, to which circumstance the Admiral attributed the famine that stared them in the face from the beginning. It gave Linois pleasure to accustom his guests to salt beef and pork, beans, and haricots, and almost to the food of the crew. He consoled them with the thought that plentiful provisions would be pro-

curable at the Cape of Good Hope. His wine was of poor quality. He personally supervised the arrangement of the table, setting out plates and chairs, and re-arranging them several times, and finally gave the carpenter instructions to make a table providing space for 17 persons only. Decaen's brother and brother-in-law were excluded from this first table because they were not superior officers.

Arrived at Simon's Bay Linois found provisions too dear, but he provided a few radishes and a couple of eggs for each of his guests. According to Decaen the *Marengo* nearly ran ashore owing to the ignorance of Linois and his officers. At this place there was an embittered altercation between the Admiral and General, because the former allowed seamen to land, while he denied the privilege to soldiers, of whom some had been guilty of disorderly conduct on arrival. Ultimately he gave way. Captain Larue appears to have been a cautious seaman, afraid of the consequence for his masts and yards of carrying too much sail, and on this subject Decaen ridicules him, saying he was laughed at both by sailors and soldiers. Linois announced that he had made great purchases of provisions, but they appeared to consist merely of some poultry in cages, a few bushels of onions, and some mushrooms which hung in a net outside his stern-walk. Linois had orders not to stop at the Ile de France, and he would not exercise any discretionary power, whereby he might have taken in provisions, though his passengers besought him to do so.

The squadron had separated during the passage, but the *Marengo* arrived at Pondicherry on the 11th July, there to find the squadron of Commodore Rainier, and the *Belle Poule* lying between two British vessels. War had already broken out afresh, but news of the rupture of the peace of Amiens had not reached the East. Everything, however, tended to show that hostilities were imminent, and almost immediately the *Bélier* brig arrived with despatches from the first Consul, written in March, reporting a great British armament to be in preparation, and ordering Linois to proceed to the Ile de France.

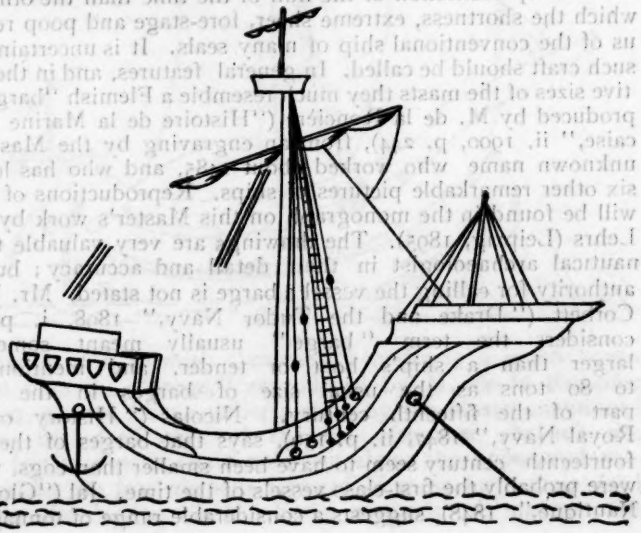
The object of this article is not to recount the course of events then or subsequently. The sole purpose has been to illustrate the relations which existed between French soldiers and sailors at the time, and some of the conditions of life in the French ships. Not everything was unsatisfactory. Decaen himself, speaks of a comedy enacted on board, of amusements in the fine weather, and of music nightly in the great cabin of the *Marengo* during the long passage. But of hearty co-operation between himself and Linois there was no trace, and their personal differences and quarrels were not without influence upon the greater events of the time.

MEDIÆVAL SHIPS IN PAINTED GLASS AND ON SEALS.

No. II.

By H. H. Brindley.

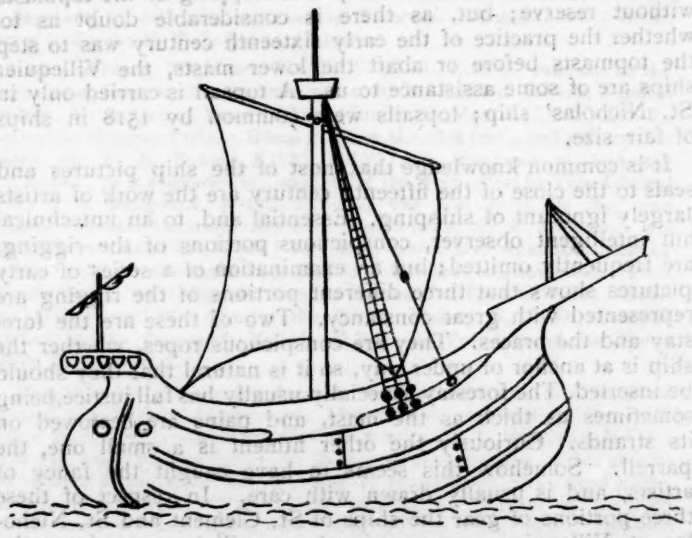
VILLEQUIER is a large village on the east bank of the Seine, two and a half miles below Caudebec-en-Caux. Like Vatteville opposite to it, and Jumièges several miles further up the river, in the sixteenth and seventeenth centuries ships sailed from its quays in the Newfoundland trade, and it furnished seamen for the naval wars of those times. Several of the windows of the parish church, which is dedicated to St. Martin, are beautiful examples of glass painting. Portions of the church date from the twelfth century, while most of it was completed early in the sixteenth, at which time the glass of both aisles was also put in. Remembering the maritime importance of Villequier in that age, it is not surprising to see pictures of ships in some of the windows. The window depicting scenes from the life of St. Jean Baptiste contains two vessels, and another window, an *ex voto* given by mariners of the families Busquet, Renault, and Breton, represents a naval combat.



The St. Jean Baptiste window is in the south aisle, second from the choir. The dedication bears the date 1518. The two ships are in the upper part of the window. They are painted with some care in yellow, which was the colour usually adopted for ships on glass of the time. On the poop of each stands a figure in bishop's mitre and robes, which is gigantic compared with the vessel, a not uncommon mode of representing the patron saint. One of the ships, painted ten years later, in the neighbouring church of Vatteville similarly carries a bishop, probably St. Clement, patron of Vatteville mariners, of vast stature on her poop. One of the Villequier ships lies at anchor with furled sails, while the other is under way. The Abbé Cochet ("Les Eglises de l'Arrondissement d' Yvetot," éd. 2, Paris, 1853, i. p. 118) identifies the two saints as St. Nicholas and St. Clement, patrons of seamen, the former being on board the anchored ship. The general features of the two vessels are illustrated by the sketches, in which the two saints and the members of the crews in the pictures have been omitted. In both cases the rigging is shown as in the windows, no portion of it has been extended where it might be supposed to be seen by the omission of the figures. Both vessels are three-masted, though in the anchored ship the saint regarded as St. Nicholas obscures the mizzen mast, which is suggested only by portions of three shrouds. The hulls resemble those we see in other pictures and certain seals of the period. That of the vessel under way, on whose deck St. Clement stands, is in form and general proportions probably a more truthful representation of the hull of the time than the other, in which the shortness, extreme sheer, fore-stage and poop remind us of the conventional ship of many seals. It is uncertain what such craft should be called. In general features, and in the relative sizes of the masts they much resemble a Flemish "barge reproduced by M. de la Roncière ("Histoire de la Marine Francaise," ii. 1900, p. 244), from an engraving by the Master of unknown name who worked about 1485, and who has left us six other remarkable pictures of ships. Reproductions of these will be found in the monograph on this Master's work by Max Lehrs (Leipzig, 1895). The drawings are very valuable to the nautical archaeologist in their detail and accuracy; but the authority for calling the vessel a barge is not stated. Mr. Julian Corbett ("Drake and the Tudor Navy," 1898, i. p. 18) considers the term "barge" usually meant something larger than a ship's boat or tender, and mentions 60 to 80 tons as the usual size of barges in the early part of the fifteenth century. Nicolas ("History of the Royal Navy," 1847, ii. p. 159), says that barges of the later fourteenth century seem to have been smaller than cogs, which were probably the first-class vessels of the time. Jal ("Glossaire Nautique," 1848), suggests a considerable range of tonnage for

the "barge." What a barge really was, both as regards size and rig, is still obscure. Perhaps the shields which adorn the poops of the Villequier ships suggest that the artist had in his mind a larger vessel than what was known as a barge.

Beside St. Clement, the only figure in his ship is a man on the look-out in the top, but in the ship of St. Nicholas three small men are in a row on the poop, apparently receiving his benediction, while at the break of the poop is a much taller sailor giving orders. The chief points of interest in the ships are, I think, as follow. In both the uppermost "waling" or "rubbing streak" (only one waling is seen in St. Nicholas' ship) is not continued along the waist. It is usually complete in pictures of the time. The shrouds are made fast to the fore part of the waling, as they are, though without dead-eyes, in the Flemish "barge" mentioned above. Possibly at this time a true "chain-wale" was not employed in small craft, if, indeed, it was at all a common fitting, when the shrouds had only just come to be set up outboard. In the very detailed and careful



engraving of a Flemish "carrack," evidently a much larger vessel than the "barge," reproduced by M. de la Roncière (*op. cit.* p. 220) from another picture by the Master mentioned above, the dead eyes of the ten aftermost shrouds are made fast to a wide chain-wale just above the uppermost waing, while the four shrouds forward of these have their dead eyes on the waling itself. Early methods of making the

shrouds fast have been discussed briefly by Mr. Alan Moore and myself in "Proceedings of the Cambridge Antiquarian Society," xiv. No. 1, 1909, p. 87. In both ships a rope with a block on it, suggesting that a purchase was in the artist's mind, leads from under the top to a hole above or in the uppermost waling, and in St. Nicholas' ship two similar ropes lead down abaft the shrouds, also through holes in the waling. Perhaps the artist had halliards in his mind, and drew them outboard in some confusion with shrouds; but more probably the "tackles," the exact use of which is undiscovered, were intended. The blocks are but a slight guide as to what ropes were intended. It is not uncommon to find what seem to be blocks on single ropes in pictures by mediæval artists, though now and again they evidently belong to purchase tackles drawn incompletely.

In St. Clement's ship the topmast is stepped exactly above the lower mast, but distinctly abaft it in the other. In view of the obvious imperfections of the pictures from a technical standpoint we cannot accept the stepping of the topmasts without reserve; but, as there is considerable doubt as to whether the practice of the early sixteenth century was to step the topmasts before or abaft the lower masts, the Villequier ships are of some assistance to us. A topsail is carried only in St. Nicholas' ship; topsails were common by 1518 in ships of fair size.

It is common knowledge that most of the ship pictures and seals to the close of the fifteenth century are the work of artists largely ignorant of shipping. Essential and, to an untechnical but intelligent observer, conspicuous portions of the rigging, are frequently omitted; but an examination of a series of early pictures shows that three different portions of the rigging are represented with great constancy. Two of these are the forestay and the braces. They are conspicuous ropes, whether the ship is at anchor or under way, so it is natural that they should be inserted. The forestay especially usually has full justice, being sometimes as thick as the mast, and pains are bestowed on its strands. Curiously the other fitment is a small one, the parrell. Somehow this seems to have caught the fancy of artists, and is usually drawn with care. In respect of these three portions of gear the ships of St. Clement and St. Nicholas at Villequier are exceptional, as will be seen from the sketches. We might wonder a little that these ships were allowed to stand as they are in so maritime a place as Villequier was in the fifteenth century, but when we remember other *ex votos* of mariners and the seals of admirals of the age, it is evident that, unfortunately for the nautical archaeologist, the criticisms which seaman would apply to actual vessels were remitted in the case of pictures.

NAVAL NOTES.

Home. The following are the principal appointments which have been made:—

Admirals—Sir A. W. Moore, K.C.B., K.C.V.O., C.M.G., to be Commander-in-Chief at Portsmouth; Sir W H. May, G.C.V.O., K.C.B., to be Commander-in-Chief at Plymouth. Vice-Admirals.—Sir F. C. B. Bridgeman, K.C.B., K.C.V.O., to be Commander-in-Chief Home Fleet; Sir G. L. C. Egerton, K.C.B., to be Second Sea Lord; Sir F. W. Fisher, K.C.V.O., to be President of the Royal Naval College, Greenwich. Captains—W. O. Boothby, M.V.O., to *Neptune* as Captain of the Fleet and Commodore 1st Class. C. R. de C. Foot to *Irresistible;* J. M. de Robeck to *Impregnable* and as Inspecting Captain of Boys' Training Establishments; G. F. Charlton to Admiralty and as Assist.-Director of Torpedoes; C. Nicholson to *Russell;* J. D. Dick to *Highflyer;* as flag-captain; A. R. Hulbert to *Hyacinth;* R. P. Purefoy, M.V.O., to *Invincible*; M. E. Kerr, M.V.O., as Assistant to Admiral Commanding Reserves. Commanders.—E. C. Carver to *Torch;* H. F. Talbot to *Attentive.*

Admiral Sir A. W. Moore, K.C.B., K.C.V.O., C.M.G., succeeds to the Command at Portsmouth, rendered vacant by the death of the late Admiral the Hon. Sir A. Curzon Howe; Admiral Sir W. H. May, G.C.V.O., K.C.B., vacates the Command of the Home Fleet on the 25th inst., and will succeed Admiral Sir W. H. Fawkes, K.C.B., K.C.V.O, in command at Plymouth next month; he is succeeded in Command of the Home Fleet by Vice-Admiral Sir F. C. B. Bridgeman, K.C.B., K.C.V.O., who will hoist his flag upon the new first-class battleship *Neptune;* Vice Admiral Sir F. Bridgeman was selected to command the Home Fleet, when it was first organised, hoisting his flag in the *Dreadnought* when that ship was first commissioned. Vice-Admiral Sir K. Le C. Egerton becomes Second Sea Lord in Sir F. Bridgeman's place and Vice-Admiral Sir F. W. Fisher, K.C.V.O., succeeds Admiral Sir G. Durnford, K.C.B., D.S.O., as President of the Naval College at Greenwich.

Rear-Admiral C. Burney hoisted his flag on board the first-class armoured cruiser *Good Hope* on the 16th ult., in command of the Fifth Cruiser Squadron, in succession to Rear-Admiral F. T. Hamilton, C.V.O., whose flag was struck on board the *Drake* the same evening, which ship is now relieved as flagship of the Squadron by her sister-ship the *Good Hope.* Rear-Admiral L. Bayly, C.V.O., hoisted his flag at Chatham on the 24th inst. on board the *Indomitable,* in command of the First Cruiser Squadron in succession to Rear-Admiral the Hon. S. C. J. Colville, C.V.O., C.B.

The second-class cruiser *Highflyer* completed to full complement at Sheerness on the 21st ult., and left Sheerness on the 26th ult. for Bombay, where she will relieve the *Hyacinth* as flagship of Rear-Admiral Sir E. F. Slade, K.C.I.E., M.V.O., Commander-in-Chief in the East Indies, which ship will return to England on the transfer of the flag. The second-class cruiser *Diana* left Plymouth on her return to the Mediterranean on the 10th ult., escorting, with the *Bonaventure,* the

Home.

three Submarines C36., C37., and C38 to Malta en route to China. The three submarines in question arrived safely with their escort at Malta on the 1st inst., and left again on the 7th inst. for Suez in tow of the *Diana, Pelorus and Barham;* from Suez the submarines will be in tow of the *Highflyer, Edgar and Pelorus.*

The new first-class armoured cruiser *Indefatigable* was commissioned at Devonport on the 24th inst., for service in the First Cruiser Squadron, which is attached to the First Division of the Home Fleet. Her joining the squadron will make it an homogeneous one of four vessels of this type, for although in many respects a better and more powerful ship than the three *Indomitables,* she is practically of the same class. The dimensions of the *Indefatigable* and the *Indomitable* and her two sisters, as compared with the new German cruiser *Von der Tann,* are as follows:—

	Indefatigable.	*Indomitable.*	*Von der Tann.*
Length ...	555ft. 0in.	530ft. 0in.	560ft
Beam ...	80ft. 0in.	78ft. 6in.	85ft.
Draught ...	26ft. 6in.	26ft. 0in.	27ft.
Displacement	18,750 tons.	17,250 tons.	19,000 tons.
I.H.P. ...	43,000	41,000	44,000 I.S.P.
Speed (Legend)	25 knots.	25 knots	27 knots.
Guns ...	eight 12in (50 cal.) sixteen 4in	eight 12in. (45 cal.) sixteen 4in.	eight 11in,(45 cal.) ten 5·9 in. sixteen 3·4 inch.
Launched ...	1907.	1909.	1909.
Cost ...	£1,547,426	£1,761,080	not known.

Doubt attaches to some of the details in regard to the *Von der Tann,* as they are not official. The broadside fire of the *Indefatigable* from the heavy guns is 6,800 lbs., as compared with 6,084 of the German ship. In speed there is probably not much difference; the *Von der Tann* was built as a 26-knot ship, but it is claimed for her that on a six hours' run she averaged 27.4 knots, with a maximum of 28 knots. The *Indefatigable* and the three *Indomitables* were built as 25-knot ships but the three older ships all much exceeded this speed, and like the *Von der Tann* have all reached 28 knots. In the case of the *Indefatigable* her trials were carried out in very rough weather, but even under unfavourable circumstances on her 30 hours' trial she made an average of 24 knots, and when doing her best at three-quarters power she reached 27 knots. At the full power 6-hours' trial, in spite of its blowing half a gale and a heavy sea running, she averaged over 26 knots; there is, therefore, every reason to believe that under more favourable circumstances she will easily reach or exceed 28 knots.

The increased length and displacement of the *Indefatigable* have been devoted, not to adding to the armament, but to increasing the arcs through which the guns can be trained. In all of these ships the turrets are placed one forward and one aft on the centre line, the remaining two being echeloned amidships. In the three earlier ships the midships turrets are so close together that the angle of fire of the offside pair of heavy guns is relatively small, so small, in fact, that for a considerable part of the 90deg. which represents a half right-angle before and abaft the beam these ships would in effect be able to bring only six of their eight 12-in. guns to bear. This objection is in great measure removed in the new ship, whose offside turret, thanks to her greater length, has a considerably wider effective angle of training.

On paper the power of the *Indefatigable* is no greater than that of her predecessors of the cruiser-battleship type—that is to say, she has the same number of guns in her battery, which comprises eight 12-inch and sixteen 4-inch. The 12-inch guns, however, are of the new 50-calibre type, having a muzzle energy of 47,700 foot-tons.

The new ship holds the record for cheapness of construction. Hitherto this position has been held by the contract-built battleship *Vanguard*, which cost £1,607,781 for her 19,250 tons, or a rate of £83.52 per ton. The *Vanguard's* speed is only 21 knots, and the fact that the 27-knot *Indefatigable* has been built for £1,547,426—£82.53 for each of her 18,750 tons,—is a remarkable testimony to the efficiency of the dockyard at Devonport, where she was built.

The *Indefatigable* is the last of the large armoured cruisers to be armed with 12-inch guns. The Colonial cruisers *Australia* and *New Zealand* will have eight of these guns, but the *Lion* and *Princess Royal*, now under construction under the 1909-10 Estimates, will carry the new 13.5-inch guns.

Result of Gunlayers' Test, 1910.—The Admiralty issued last month the result of the test of Gunlayers with heavy guns in the Fleet during 1910 (Admiralty, Gunnery, Branch, No. 484).

Their Lordships in a note to the document express their satisfaction that the standard of shooting which was attained in 1909 has been maintained.

The abstract of the firing for 1910, which appears on the second page of the Return, shows the China Squadron for the fourth year running first in order of merit, with the *Bedford* as the best ship of the squadron. The second place in the list is taken by the Home Fleet, Second Division and Second Cruiser Squadron, with the first-class armoured cruiser *Natal* as the best ship, with the remarkable score of 90.48 points to her credit. The third place in order of merit is taken by the Cape of Good Hope Squadron, with the flagship *Hermes* as best ship. The other fleets or squadrons stand as follows:—Home Fleet best ship. The other fleets or squadrons stand as follows:—Home Fleet, Cruiser Squadron; Fourth Cruiser Squadron; Atlantic Fleet and Fifth Cruiser Squadron; East India Squadron; Mediterranean Fleet and Sixth Cruiser Squadron, and Australian Squadron.

In the table which gives the firing by the different descriptions of guns the *Temeraire* stands first in order of merit with the 12-inch gun; the *Lord Nelson* comes next, and the *Africa* third; the first two of these ships belong to the Home Fleet, First Division, and the third to the Second Division of the same Fleet. The table, which gives the Fleet classified in order of merit of ships competing, places the *Natal* for the second year running first ship, with a score of 40.48 a slight increase over last year, when she headed the list with a score of 89.44; the *Temeraire* second with a score of 81.91; and the Hermes third with 75.66, the *Britannia* following close with 74.38. The best shots in these ships in the order named being Petty Officers 1st Class A. Murrin and J. Scott, Bombardier, R.M.A., H. Oliver and 1st Class Petty Officer F. Lacy. Altogether 117 ships took part in the test.

The award of the medal will be promulgated in due course.

	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.
Number of ships that fired ...	127	139	134	108	100	89	121	117	116	117
Number of guns or turrets ...	1,137	1,241	1,296	1,171	1,096	1,073	1,365	1,277	1,312	1,318
Number of hits ... { 1906 target	3,562	4,789	5,996	5,748	4,374	5,733	7,547			
Number of hits ... { 1907 "							4,073	4,826	5,108	3,250
Number of hits ... { Ricochet										436
Number of misses { 1906 target	6,244	6,863	7,028	7,664	8,357	2,328	1,991			
Number of misses { 1907 "							5,465	4,183	4,330	3,523
Excess of hits over misses { 1906 "	Nil	N i	Nil	Nil	1,017	3,405	5,556			
Excess of hits over misses { 1907 "							Nil	643	778	703
Excess of misses over hits .. { 1906 "	2,682	2,074	1,032	1,916	Nil	Nil	Nil			
Excess of misses over hits .. { 1907 "							1,392	Nil	Nil	Nil
Percentage of hits to rounds fired { 1906 "	36·3	41·1	46·04	42·86	56·58	71·12	79·13			
Percentage of hits to rounds fired { 1907 "							42·70	53·57	54·12	51·85 *†
Hits per gun per minute:—										
12-inch and 10-inch ... { 1906 target	·33	·38	·53	·47	·58	·81	·61			
12-inch and 10-inch ... { 1907 "							·40	·56	·63	·70*
9·2-inch ... { 1906 "	·31	·35	·70	·73	1·40	2·84	3·25			
9·2-inch ... { 1907 "							2·01	2·20	1·94	2·01*
7·5-inch ... { 1906 "							3·48			
7·5-inch ... { 1907 "							1·58	2·51	2·47	2·61*
6-inch B.L. and Q.F. ... { 1906 "	1·81	2·41	2·63	2·63	4·14	5·68	5·93			
6-inch B.L. and Q.F. ... { 1907 "							3·32	3·98	4·03	3·69*
4·7-inch Q.F. and 4-inch B.L. and Q.F. { 1906 "	1·93	2·02	2·47	2·28	3·73	4·96	5·73			
4·7-inch Q.F. and 4-inch B.L. and Q.F. { 1907 "							2·38	3·32	4·06	3·84*
Number of ships from whom no returns were received.	47	19	30	43	Nil	Nil	3	8	10	12

* Ricochet hits counting half a hit. Not directly comparable with previous years.
† The figures for 1910, counting ricochet hits as a whole hit, as in previous years, would be 54·86.

Abstract, 1909.

Order of Merit.	Fleet or Squadron.	No. of Ships.	No. of Men Firing	Points per Gun or Turret.	First Ship in Fleet.	Scores.
1	China	6	70	56·628	*Bedford* ...	67·81
2	Home Fleet, Second Division and Second Cruiser Squadron	16	226	47·567	*NATAL* ...	90·48
3	Cape of Good Hope	3	29	46·930	*Hermes*	75·66
4	Home Fleet, Third Division and Cruisers	27	304	46·195	*Mars* ...	72·62
5	Home Fleet, First Division and First Cruiser Squadron.	15	156	45·798	*Temeraire* ...	81·91
6	Fourth Cruiser Squadron	3	24	41·888	*Brilliant* ...	52·52
7	Atlantic Fleet and Fifth Cruiser Squadron.	11	167	41·303	*Drake* ...	67·27
8	East Indies	1	11	40·09	*Hyacinth* ...	40·09
9	Mediterranean Fleet and Sixth Cruiser Squadron.	13	170	37·641	*Exmouth* ...	51·57
10	Australia	8	82	35·455	*Powerful* ...	55·65
11	Special Service Tenders	14	79	29·650	*Cornwall* ...	71·42
	Total, 1910 Test	117	1,318	42·649		
	Total, 1909 Test	116	1,312	46·098		
	Difference	+1	+6	−3·449		

Note.—The 4-inch guns of *Bellerophon* and *Invincible* classes are not included in this abstract.

Home.

Beri-Beri in the "Sphinx."—The following Remarks as to the outbreak of Beri-Beri in the *Sphinx*, by Staff-Surgeon A. J. Laurie, with a suggestion as to a possible cause, may be of interest:—

While up the Gulf, surrounded by cases of beri-beri, and doing my best to find a possible explanation of its causation, it occurred to me from one or two symptoms I had noticed in a good proportion of my cases, that possibly the disease was due to some form of gastric irritant poison. I then proceeded to carefully examine the rice, fish, ghee, &c., constituting the daily diet of the lascars. There was nothing noticeably wrong with the rice. It certainly did not smell mouldy, and in appearance was quite good. Being able to speak Hindustani almost as well as I can English, the lascars are quite open and outspoken to me when I happen to ask them anything. They, I am sure, would not hesitate to tell me if anything was wrong about their diet. On several occasions they brought me their dried fish, complaining that it was mouldy. When this was found to be the case I condemned it. Also they complained of their ghee. The rice, however, was never complained of, but to make sure that it was in every way satisfactory to the lascars I spoke to the head sahrangs. They said it was perfectly good. Eating the quantities they do, I take it, they must know a great deal more about the appearance, taste, &c., of a good rice than we English are likely to from a first or second examination, though we may have read and digested many leading articles written by medical men on the appearance of good cured and uncured rice. Theory is essential, no doubt, but a little experience (and practical at that) is worth a ton of theory.

I therefore have suggested that the men should be allowed to select a good cured grain themselves, and, if passed by the authorities, this one should be supplied.

Nothing being found wrong so far as the rations were concerned, I next proceeded to go into the question of the cooking utensils. These articles, as is well known, are all made of copper and are then "tinned" or "calayed" (native term) inside. Re-tinning is carried out at least monthly ashore, the poorest being particular about this. To my astonishment, I found this re-tinning was never carried out in our ships up the Gulf. That is to say, for from 8 to 10 months each year this important point has always been overlooked. It then occurred to me that possibly this may have something to do with our beri-beri. Being such a revolutionary idea I have not been very eager to bring it forward, but since my return to Bombay, I see that Lieut.-Colonel McGill, at the Indian Medical Congress last winter, showed that what was undoubtedly an epidemic of beri-beri he had charge of, was in his opinion, caused by excess of beer (the epidemic occurred in a British regiment in India). Perhaps it was alcoholic neuritis, but the symptoms were those of beri-beri. If it was the beer, no doubt it was due to chronic arsenical poisoning, the arsenic entering the beer in the cheap sugar used in its manufacture. Lead again is a well-known cause of neuritis, and both of these cause gastric symptoms, the former with diarrhœa and the latter with constipation. Arsenic causes ulceration of mouth and arms. Lead affects the gums—blue line. As Lieut.-Colonel McGill, R.A.M.C., I find has already suggested arsenic as a cause, I feel justified in bringing forward copper, which I hope to show is not at all unworthy of consideration.

Home.

Reasons why chronic copper poisoning may be a cause of beri-beri:—

1. Source of copper. The dishes used being of copper and not retinned for 8 to 10 months on end, all the dishes were found to be devoid of any tin inside. The natives of India find that if this tinning is allowed to wear off they suffer from gastritis and diarrhœa.

2. How taken up into the food. It has been found that certain foods and condiments are more liable to act on copper cooking utensils than others. Fats easily decompose and their acids and also vegetable acids contained in some fruits quickly attack copper ("Forensic Medicine and Toxicology," J. Dixon Mann). Applying this to our lascar's case, I saw that everything was present to favour copper poisoning as a possible cause of our troubles. If there is one thing the Indian native loves in his food it is fat—everything he eats is greasy. Then again the ghee (clarified butter) is often rancid, and up the Gulf it is not easy to get good ghee at all times. Some that was being used created such an odour that those officers using the bridge had to complain and eventually my attention was drawn to this; the article was surveyed and condemned.

3. Symptoms of chronic copper poisoning. These will be found to be not at all unlike those of beri-beri. Epigastric pain and vomiting, diarrhœa, a greenish line along margin of gums, ulceration of some. This ulceration leads to extensive destruction of the gums, and the pus is of a greenish colour. I tested this pus for copper and obtained a faint copper reaction. It was, however, not well marked enough to satisfy me that copper was certainly present, only on comparison could one see a difference. An important sympton common to both conditions is neuritis. This may affect any nerve, and, therefore, the heart may be involved in copper cases, as in beri-beri. Further on a few notes on ulcerative gingivitis with increased pulse rate will be found; these I maintain are due to copper poisoning. Up to the present time gingivitis has not been described as a sign of beri-beri, but in the 16 cases I had on board it was present in seven and had been noted in two men previous to their coming sick with beri-beri. At Muscat I examined the gums of Captain Scott's servants. They all showed signs of old gingivitis, but no active disease was present. These men were now cooking all their food in aluminium dishes, which accounts for absence of active disease.

France. The following are the principal promotions and appointments which have been made:—Rear Admirals—F. P. Arago to Vice-Admiral; E. J. Perrin to be Director of the Superior Naval War-School; E. E. Nicol to command of Reserve Division of 1st Squadron, Capitaines de Vaisseau—E. E. Nicol to Rear-Admiral; A. A. Lefèvre to *Diderot;* J. V. Pradier to *Marceau;* F. G. Pigeon de Saint Pair to *Verité;* M. H. Mercier de Lostende to *Suffren;* E. J. Aubry to *Gaulois,* Capitaines de Frégate—E. A. Vergos, J. P. Delage, C. L. Mornet, M. I. Grandclément to Capitaines de Vaisseau; P. Garnault to command of Madagascar Naval Division; D. M. de Champeaux La Boulaye to *Marigot* and command of the Senegal Naval Station—*Journal Official de la Republique Française.*

Vice-Admiral Caillard, on his retirement for age on the 12th ult., has been awarded the *Médaille Militaire.* He entered the Navy in 1860 and he has a total service of 48 years 5 months, out of which 26 years 10 months were spent at sea. His war services include Mexico and the Siege of Paris 1870-71. He commanded the Northern Squadron July 1903—

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September 1905, was Inspector General of the Fleet and President of the *Conseil Superieur de la Marine*, October 1909, and received the Grand Cross of the Legion of Honour, August, 1910.

Duties of the 2nd Commander in the new battleships.—A Ministerial decree has been issued modifying that of the 13th May last determining the duties of the 2nd Commander (Capitaine de Frégate) appointed to ships of 18,000 tons and upwards.

Under the orders of the Senior Commander he will have special charge of all guns, torpedoes and electrical fittings, and be responsible for drawing up the programmes of exercises and drills, superintending all practices, and submitting proposals to increase the fighting power of the ship.

Changes in Uniform.—Some change has been recently made in the uniform of the French bluejacket; the general effect will be that of making the uniform a little less showy (*plus sombre*), the blue collar is to be retained but will not be attached to the white frock as before, and a navy blue jersey is substituted for the familiar blue and white striped jersey hitherto worn, the jumper is a little longer and rather tighter, the trousers straighter and not so full; the cap retains the red pompon but is rigid in form.

Reorganization of the Light Divisions.—In accordance with a decision of the Minister of Marine, as soon as the first-class armoured cruisers *Edgar-Quinet* and *Waldeck-Rousseau* which are about to be commissioned, are ready for sea, the composition of the Light Divisions will be as follows:

Light Division of the 1st Squadron.

First-class Armoured Cruisers.—*Jules-Ferry, Victor Hugo* (to be relieved by the *Waldeck-Rosseau* and *Edgar-Quinet*), *Ernest-Renan, Léon-Gambetta.*

Light Division of the 2nd Squadron.

First-class Armoured Cruisers.—*Marseillaise, Gloire, Amiral-Aube, Condé.*

Formation of Reserve Divisions.—The Minister of Marine has decided to form at Brest and Toulon Reserve Divisions of ships of the 1st line.

In accordance with this new arrangement the Toulon Division will consist of the following vessels:

First-class Armoured Cruisers.—*Jules-Michelet, Victor-Hugo, Jules-Ferry.*

First-class Cruisers.—*Chateaurenault, Jurien-de-la-Gravière, Foudre.*

Third-class Cruisers.—*Casablanca, La Hire.*

The Division stationed at Brest will consist of:

Armoured Cruisers.—*Dupetit-Thouars, Amiral-Gueydon, Montcalm, Jeanne-d'Arc, Kléber.*

First-class Cruiser.—*Guichen.*

Third-class Cruiser.—*Cassini.*

These first-line reserve divisions will only include ships completely fit for service and ready to proceed to sea at the short notice prescribed by the regulations. Consequently the ships will only join the above-mentioned divisions after the necessary repairs in course of being carried out upon them have been completed. When attached to their divisions ordinary repairs will be effected by their own artificers, with the help of the repair-ship, recourse being had to the dockyard only when absolutely required. When such important repairs have to be undertaken, they must be authorised by the Minister of Marine, and the ship for the time being will be classed as unfit for service.

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The ships of these reserve divisions will have a normal reserve crew of officers and men, who will have to serve on board them for at least a year.

The reserve divisions will be under the orders of a Rear-Admiral, who will command them in case of mobilisation for war or for manœuvres. The Rear-Admirals commanding the reserve divisions at Toulon and Brest will report to the Commanders-in-Chief of the 1st and 2nd Squadrons, respectively, and they will be responsible for keeping their divisions in a state of efficiency and readiness for sea. Service in command of these divisions will not count as sea-service.—*La Vie Maritime.*

Second-Line Units.—The Minister of Marine has decided to distribute between the ports of Lorient and Rochefort all the second-line units as follows, with the exception of those specially attached to the port of Toulon:—

Rochefort.—Third-class Cruisers.—*Lavoisier*, on its return in the autumn from the Iceland fisheries protection duty; *D'Estrées*, on being relieved at Bizerta; *Forbin*, *Surcouf*, *Cosmao*. First-class Gunboat.—*Surprise*, detached from Toulon.

Lorient.—Second-class Cruisers.—*Du Chayla*, *Descartes*, *Cassard*, *Friant*, *D'Entrecasteaux*.

Toulon.—Armoured Cruisers.—*Amiral-Charner*, *Bruix*, *Latouche-Treville*, *Pothuau*. Transport-Avisos.—*Bien-Hoa*, *Vinh-Long*.

This new distribution will be carried out as rapidly as possible. The *Surcouf*, now at Lorient, will be commissioned immediately and proceed to Rochefort; the *Surprise* will be kept at Toulon for completion of repairs and will then be directed to Rochefort; the *Descartes*, which has been commissioned for trials after repairs at Toulon will on their completion proceed to Lorient; the *D'Entrecasteaux* similarly after completion of her repairs at Toulon will proceed to Lorient, as will also the *Cassard* from Cherbourg.

As regards the second-class cruisers *Isly* and *Alger*, at present lying at Lorient and Rochefort respectively, they will remain at those ports until a decision has been taken as to whether they shall be taken in hand for repair or be condemned as unfit for further service.

The ports of Rochefort, Lorient and Toulon will, from this time on, from the point of view of *Matériel* and Administration, be the centres of the second-line ships attached to them. These ships will be kept in a state ready for sea at the usual short notice, and will be in the normal reserve; the other vessels will be placed in the special reserve.—*La Vie Maritime.*

The New Battleships.—Sanction has been given for estimates to be prepared for two new battleships of the *Jean Bart* class. The *Temps* says if the proposed building programme is to be completed greater use must be made of private yards. In 1910 England launched 43 units of 133,025 tons, Germany 21 of 49,024 tons, the United States 13 of 30,287 tons, but France only 12 of 24,063 tons, which latter total is 13,000 tons less than the mean of the last ten years. On the other hand, while since January 1906 England has built only 35 per cent. of her new tonnage in Government yards and Germany and the United States but 20 per cent., France has built 54 per cent. of the total tonnage of her large ships in her

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dockyards, and more than 40 per cent. of her torpedo craft in the government arsenals, though as regards this latter class it is the custom in other countries to entrust the whole of their construction to private firms. However, as matters stand there is now not much choice, and if the new battleships are to be built in France they will have to be given out to contract.

It is stated that the *Compagnie des Forges et Aciéries de la Marine et d'Homicourt*, by improving its means of production, is now in a position to supply the French Navy every 12 months with the complete armament of a *Dreadnought* battleship, namely six turrets with machinery and their complement of 12 heavy guns and the necessary munitions, besides fulfilling its orders from foreign governments.—*Le Temps.*

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Steam Engineering Competition.—The economy steaming competitions have effected a saving of large sums of money to the government in coal bills in the last year. During the first half of the fiscal year 1910 the vessels of the navy used 350,296 tons of coal. Compared with the previous year this represents a saving of 56,578 tons. Since December the average coal consumption of all vessels of the navy per knot run at a given speed has further decreased 5 per cent., and the average mileage per gallon of lubricating oil has increased 8 per cent. On the U. S. S. *Kansas* there has been a continuous improvement, aggregating 12 per cent., and the *Kansas* now leads the battleships in economy of coal consumption. The port coal consumption of the three scouts has decreased 11 per cent. The most notable improvement on any vessel in the fleet was in the *Missouri*, where the amount of coal per knot under way was decreased 25 per cent., and the amount of coal used daily in port was decreased 35 per cent. On the return trip of the fleet from Guantanamo the speed was 12.4 knots, as against 11.5 going down, and, although the ships had been several months longer out of dock, the increased speed returning was maintained for about 150 tons less coal daily than was consumed going down. The saving in the first half of the year was partly due to a decrease in the amount of cruising, although the latter was to a great extent counterbalanced by a considerable increase in the average speed. The U.S.S. *New Hampshire* uses the least lubricating oil in port, while the *Montana* has used the least make-up feed water.—*Army and Navy Journal.*

Bureau of Construction and Repair.—The charge so often made that the United States is behind other large nations in the time required for building battleships, is refuted in the annual report of Chief Constructor Washington L. Capps, U.S.N., until recently chief of the Bureau of Construction and Repair. Erroneous impressions as to the rapidity with which our ships have been built have grown out of the difference in dates chosen for making the comparisons. In some instances the date of authorisation was taken, or the date of signing the contract or the date of laying the keel. Similarly was there a difference as to the date of completion. Some would count the day of the contract

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trial for speed, others would take the date of actual delivery, while again the day of going into commission would be chosen. Comparisons for each set of dates is made, and this is the conclusion: "With the system and methods of warship construction now in vogue in the United States, it is believed to be feasible for the United States to build first-class battleships in as short a time as any other shipbuilding country, and actual experience seems to demonstrate that the rapidity of construction in the United States is greater than the average rate of construction in the principal foreign shipbuilding countries. It is also worthy of note that this decreased time of construction has been obtained concurrently with a decrease in the unit cost of construction. In fact, the total cost, per ton of displacement, of battleships built by contract for the United States Navy within the past few years, has been less than the total cost, per ton of displacement, of similar vessels built in foreign countries, and this in spite of the higher rates of wages paid to workmen in United States shipyards."

From a tabular comparison of speed in building, from keel laying to commissioning, we have made this summary: In building the *new Hampshire, South Carolina, Michigan, Delaware,* and *North Dakota,* five ships, the total average time was two years and nine months. Great Britain beat this by only two months, counting the time spent in building the *Lord Nelson, Bellerophon, Temeraire* and *Superb,* which averaged two years and seven months. The time of the *Dreadnought* is not counted in our average because she was not completed when commissioned. Germany's average was one month longer than ours. Taking the *Pommern, Hannover, Schleswig-Holstein, Schlesien, Nassau, Westfalen, and Rheinland,* we find that the average there was two years and ten months. Japan's average for two battleships was four years and six months, and Italy consumed five years and five months on an average in constructing three ships.

The date of the completion of the *Florida* and *Utah* will be delayed because of changes approved subsequently to the laying of the keel. While every effort has been made to eliminate such changes, Mr. Capps points out that the improvements in naval *matériel* make it almost impossible entirely to eliminate these changes. From tables showing the number and displacement of various classes of vessels from 1st January, 1904, to 30th September, 1910, it appears that the total battleship displacement available for service has increased in a little less than seven years from 118,732 tons to 412,461 tons. The total battleship displacement available for service, under construction and authorised, has increased from 324,461 tons to 562,111 tons, and the total displacement of what might be called "military vessels" has, including those under construction and authorised, increased from 651,266 tons on 1st January, 1904, to 940,112 tons on 30th September, 1910. In a finely phrased tribute to the loyal and conscientious assistance of his subordinates in his seven-year incumbency, we are told that no "public official could possibly have had more devoted, intelligent and efficient assistants," and that such success as has been achieved by the Bureau has been in the highest degree the result of the "earnest and effective co-operation" of the officers and civil employees associated with him.—*Army and Navy Journal.*

MILITARY NOTES.

THE KING.

It is officially announced that the King has been pleased to approve the appointment of Field-Marshal Viscount Kitchener of Khartoum, G.C.B., O.M., G.C.S.I., G.C.M.G., G.C.I.E., to command the troops assembled in London on the occasion of their Majesties' Coronation.

The following General Officers will, by His Majesty's command, act under his Lordship's orders in the capacities stated:

CHIEF STAFF OFFICER.

Major-General A. E. Codrington, C.V.O., C.B. (General Officer Commanding London District).

COMMANDERS OF SECTIONS OF THE ROUTES OF THE PROCESSIONS.

General Sir Charles Douglas, K.C.B. (General Officer Commanding-in-Chief Southern Command).

Lieutenant-General Sir Horace Smith-Dorrien, K.C.B., D.S.O., A.D.C. (General Officer Commanding-in-Chief Aldershot Command).

Lieutenant-General Sir Arthur Paget, K.C.B., K.C.V.O., A.D.C. (General Officer Commanding-in-Chief Eastern Command).

Home. The following are the principal appointments which have been made:—

Major-General.—Frederick T. Clayton to be Major-General in charge of Administration, Irish Command; Colonels.— Stanley B. Von Donop to be Director of Artillery at the War Office, with temporary rank as Brigadier-General; John P. Du Cane to command the Artillery, 3rd Division (Southern Command), with temporary rank as Brigadier-General; Thomas F. Bushe, C.M.G., to command of Ordnance College; Walter G. Crole Wyndham, C.B., to be Colonel in Charge of Cavalry Records (Canterbury); Edgar F. Nelson to be an Assistant Director of Artillery at the War Office; William G. B. Western, C.B., to command No. 8 District (Southern Command). Lieutenant-Colonel.—John Vaughan, D.S.O., to command of Cavalry School, Netheravon.

Territorial Force.—Major-General.—Colin G. Donald, C.B., to command Wessex Division (Southern Command).

Indian Army—Major-General C. J. Bloomfield, C.B., D.S.O., to command a Division. Colonels.—Hugh O'Donnell, D.S.O., to command Bannu Brigade (Northern Army); Hew D. Fanshawe, C.B., to command Presidency Brigade (Northern Army); F. C. Beatson, C.B., to be Brigadier-General General Staff (Southern Army).

Austria-Hungary. *Numbers of General Officers on Active List.*—According to the Army list for 1911, the number of General Officers on the active list in the Austro-Hungarian Army, exclusive of the Arch-Dukes, is 334, of whom 36 are Generals of Army Corps, 102, Generals of Division, and 196, Generals of Brigade.

(*a*) *Present Employment*:

Per cent.		*Generals of Army Corps*	*Generals of Division*	*Generals of Brigade*	*Total.*
5.0	Are at Court	8	6	3	17
25.0	At the Ministries of War or employed away from the Army	9	37	39	85
66.0	Serving with the Army	18	57	144	219
4.0	Unemployed	1	2	10	13
	Total	36	102	196	334

(*b*) *Branch of Service*:

22.1	are from the Infantry	,,	5	72	77
12.0	,, ,, ,, Cavalry	5	14	21	40
6.0	,, ,, ,, Artillery	1	7	13	21
8.0	,, ,, ,, Engineers	,,	10	17	27
1.0	,, ,, ,, Pioneers	,,	1	3	4
0.9	,, ,, ,, Engineer Corps	,,	,,	3	3
50.0	,, ,, ,, General Staff	30	65	67	162
	Total	36	102	196	334

From this distribution it appears that it is extremely difficult for a regimental officer to reach the rank of General Officer and that it is specially accessible to an officer of the General Staff, since 83 per cent. of the Generals of Army Corps, 63 per cent. of the Generals of Division and 34 per cent. of the Generals of Brigade—in all 162 Generals—come from the General Staff Corps.

These 162 Generals belong:

Per cent.		*Generals of Army Corps*	*Generals of Division*	*Generals of Brigade*	*Total.*
69.0	to the Infantry	19	37	56	112
14.0	,, Cavalry	4	13	5	22
14.0	,, Artillery	6	12	4	22
2.0	,, Engineers	,,	3	1	4
1.0	,, Pioneers	1	,,	1	2
	Total	30	65	67	162

Revue Militaire des Armées Etrangères.

Budget for the Austrian Landwehr for 1910.—The estimates for the Austrian *Landwehr* for 1910 were discussed and voted by the Austrian Chamber last August. The total expenditure allowed for amounted to £4,112,555, showing an increase of £474,865 over 1909. If from this total is deducted the expenditure upon the Gendarmery and Military Police

there remains, as purely military expenditure, a sum of £2,934,686, showing an increase of £332,581 over the previous year.

The effective maintained is as follows:—

	1910		*In comparison with* 1909
Officers	3,474	+	215
Officials	962	+	42
Subaltern Employees	211	+	24
Probationary Officers	252	+	18
Re-engaged Non-Commissioned Officers...	4,768	+	63
Men (less the Re-engaged Non-Commissioned Officers...	39,538	+	2,769
Pupils of the Schools	489	+	1
Horses belonging to the Government	5,985	+	870
„ „ Officers...	1,872	+	6

This very appreciable increase in the effectives is the result of the different additions which have been indicated in the Ordinary Budget.

The figures relating to the calling out of the Reservists and Ersatz-Reservists differ but little from those of 1909:

14,000 Ersatz-Reservists have been called out for the first time for eight weeks. 93,349 Infantry, 4,664 Cavalry and 672 Artillery have carried out a period of training of 28 days. It has to be noticed that this is the first time that Artillery-Reservists have been called out.

1.—*Ordinary Budget*: The increase in expenditure principally affects the Ordinary Budget, and is caused as follows:—

(*A*) *Infantry*:

1. The organisation of 104 machine-gun detachments of 2 guns each (raising to 107 the numbers of these detachments);
2. The creation of seven field-officers' appointments, starting from the 1st of last May, to superintend the regimental musketry instruction;
3. The creation of 10 new appointments for subaltern officers (1 sub-lieutenant, 9 lieutenants) starting from the 1st November, 1910. This is the continuation of a measure commenced in 1909, and is intended to provide by degrees 3 officers for every company;
4. The creation, starting from the 1st October, 1910, of 121 appointments of hospital non-commissioned officers for regimental duty, with an equal deduction from the effective of the privates of the hospital service.

(*B*) *Mountain Troops*:

1. The creation of a Regimental Staff, of two Battalion Staffs, of nine Companies, and of a Depot battalion cadre.
2. The constitution of two 4-gun machine-gun detachments, raising the number of these detachments to 13;
3. The creation of four appointments for captains, starting from the 1st November, 1910. This step, which follows on the lines pursued in previous years, is intended to ensure progressively the command on mobilisation of frontier covering companies (*Grenz-Schutzkompagnien*), formed from the *Landsturm*, by captains of the active *Landwehr*.

Austria-Hungary.

(*C*) *Artillery*:

1. The transformation of the eight two-battery divisions of guns into divisions of howitzer-batteries;
2. An innovation in one of the drill periods for the Artillery Reservists;
3. A demand for a supplementary grant of £9,792 for the firing schools.

(*D*) *Diverse*:

1. Purchase of 250 pack-animals to be handed over on the regulation conditions, after four months' training, to the charge of private owners;
2. The expenses of maintenance of four automobiles with their chauffeurs for the mountain troops.

To all these increases in expenditure must be added £19,491 to raise the infantry and artillery munition supplies and £11,385 necessitated to provide against the increased cost of provisions.

II.—*Extraordinary Budget*: The Extraordinary Budget amounted to £165,128, an increase of £56,066 over 1909. It is intended for:

1. The equipment of bât animals for the machine-guns; the purchase of repeating pistols and carbines; and the completion of the provision of the troops with field-glasses, range-finders, telephones, etc.;
2. The reconstruction of Rifle Ranges;
3. The supply of the grey field-uniform.

Revue Militaire des Armées Etrangères.

A Year's Progress.—The Austro-Hungarian Army has, since the annexation of Bosnia-Herzegovina two years ago, undergone a material and astonishing reorganisation. It has been thoroughly brought up to date and strengthened, and has once more taken its proper place among the Armies of the Great Powers; another not less noteworthy result of the crisis is to show that the necessity of completing as soon as possible the country's defence works is recognised. All parties have joined in insisting on the importance to the State, and the different nationalities composing it, of having an Army ready at all points to take the field.

This rapid progress to effectiveness has not passed unnoticed abroad, and the high opinion held of the Austro-Hungarian military organisation is shown by the large number of foreign officers who now come to complete their military instruction with the Army. Last July a special course of instruction for foreign officers was formed at the Musketry School at Brück, which was largely attended by Turkish officers, while officers from the Roumanian, Bulgarian, Chilian, Danish, Dutch and Swedish armies are attached to different arms of the service, or are attending courses at the special schools.

Unfortunately the progress made could not be put to the test last year by the Grand Manœuvres, as, owing to the presence of contagious diseases among the horses, the Imperial Manœuvres, which were to have taken place on a larger theatre of operation than the preceding year, viz., in the mountainous and extremely wooded region of the Beskides and the Carpathians had to be cancelled.

The rejuvenation of the superior cadres of the Army made, during 1910, considerable progress, although the amelioration in the conditions

Austria-Hungary.

of promotion in the lower grades has not as yet had much effect. The time of service in the rank of captain and as subaltern officer is still extremely long, as promotion to major under normal circumstances to-day cannot be obtained until after 25 to 30 years' service as an officer.

Among other important changes has been the removal of the headquarters of the XVIth Corps from Zara to Ragusa: and the organisation into Independent Divisions of the Divisions of the territorially broken up (the annexed territory and Dalmatia) XVth and XVIth Corps, which will be kept up to strength, however, by new recruiting arrangements that have been made, a periodical change of battalions and their officers, and by certain administrative measures.

The infantry is suffering somewhat from the effectives being still rather below strength, and except for a new distribution of the non-commissioned officers, has undergone no material change since last year. On the other hand, the Austrian *Landwehr* has continued its development; the 27th *Landwehr* Infantry regiment has been transformed into a mountain regiment at the same time as the 2nd battalion of the *Landwehr* Regiment No. 4 (Goerz) has been incorporated with it. The up-to-date equipment of the *Landwehr* infantry has been completed by supplying to the smaller units, along with the existing waggons, bât animals for the transport of munitions.

In the Cavalry, with the exception of the creation of a new division, there has been no change in the organisation. The addition of Cyclist sub-divisions to the Cavalry divisions, and the substitution of telegraph columns for the telegraph patrols is in contemplation. On the other hand, preliminary investigations for the re-equipment of the Cavalry have been completed. This will be on the lines of a further adaptation of the field uniform to the necessities of the battlefield (without, however, a change of colours), comfort and hygiene, diminution of the weight on the horse, an increase in the number of cartridges for the rifle, simplification of the equipment, and suppression of everything bright.

The rearmament of the field-artillery has been carried on, firing trials and marching tests on a considerable scale with the Marks 8 and 9 mountain guns have been carried out, as well as with the new 10 cm. (4-inch) mountain howitzer on recoil carriage. These guns are now being issued to the XVth and XVIth Corps.

The Artillery School of Firing has been reorganised and divided into two; one for field and fortress artillery at Hagueastier (near Vezprim in Hungary), the other for Mountain Artillery is to be established at some place not yet determined upon by the Minister of War. The experiments in connection with the transporting of heavy guns, which were carried on all last year, have been completed, and, according to the *Vedette*, it has been found possible to transport a heavy 24-cm. (9.4-inch) siege mortar on a 6-cylinder 100-H.P. Daimler Automobile at a speed of 9 and 1-3 miles an hour, a result which makes this gun, relatively speaking, a mobile weapon.

An important modification has been made in the organisation of the Train; there will be for the future six Train-Inspectorates, and the three regiments will be replaced by 16 Train-Divisions, each of which will be composed of a Divisional Staff, a certain number of Train Squadrons, with Depôt and Park Cadres.

Austria-Hungary.

There has been considerable development in the technical branches. The sub-divisions of fortress and field balloonists have been strengthened, and the establishment of stations at Wiener-Neustadt and Fischamend has given a great impulse to Military Aerostation. It is announced that three Aeroplanes are to be acquired for the Army, which will be required to fulfil the following conditions:

1. Execute a flight between two fixed points at a mean speed of 43½ miles;
2. To be able to carry two people, the pilot and one passenger, weighing at least 151 lbs. all together, with 154 lbs. of excess weight;
3. The machine to be able to be taken to pieces in an hour so that it can be carried on an automobile, while its putting together again is not to take more than two hours.

After a trial flight at high altitudes and a six hours' flight, the Dirigible balloon "Lebaudy," supplied by the Society of Dirigible Balloons, has passed definitely into the hands of the Army and is to be known as "Army Dirigible No. 11." The lifting capacity of this balloon is, however, to be increased to 400 cubic metres, so that it can be fitted with wireless telegraphy apparatus. A third Dirigible, constructed for the Army by Rörring at Vienna, arrived at Fischamend for its trials at the end of November, and the flying ground there has been supplied with a vast hangar and all the necessary apparatus for the production of hydrogen gas for inflating the balloons. If Aerial navigation has not made as much progress in the Austrian Army, as in some others, the period of uncertainty is now passed and its development is at last proceeding steadily. The flying ground and establishment at Wiener-Neustadt is also becoming more and more important; its excellent situation and the complete way it has been fitted up have decided the Minister of War to make it the principal military aviation practice ground; several officers have already acquired their certificates as pilots there, and many more are under training. In this new branch of military science the Army is now quite independent of foreign assistance, both as regards the training of officers and in the matter of the construction of aeroplanes. Last year marked the formation of both Hungarian and Austrian Societies whose special object it will be to study all questions connected with Aviation, and to undertake the construction of flying machines capable of satisfying all military requirements.

In the technical domain it may also be mentioned that wireless telegraphy stations have been installed at many of the fortresses, while detachments of automobiles to carry search-lights have also been formed.

In accordance with a recent order the Military Engineer Constructors have been constituted into a Corps of Officer-Engineers, whose duty will be in time of peace, as in war, to undertake all military construction work other than that of fortification.

Important modifications have also been made in the medical branch, by the organisation of a hospital service to be attached to each infantry division, by the increase of the medical staff attached to the Cavalry, by the increase of the medical reserves, due to the breaking up of those of the *Landsturm*, and by the organisation of two squadrons of mounted stretcher parties also in the Cavalry.—*Revue Militaire Suisse.*

Germany. *The Sanitary Report on the Horses in the Prussian, Saxon and Wurtemberg Armies in* 1909.—The following information is taken from the *Statistischer Veterinär Sanitäts Bericht* for 1909. The statistics refer to the whole German Army with the exception of the three Bavarian Army Corps.

The total number of horses on service on 31st December, 1909, was 109,384. In the course of the year, 53,513 horses were under treatment, to which must be added 1,198 horses remaining under treatment from the previous year on 1st January, 1909, making a total of 54,711 sick.

The proportion works out, therefore, at 50.01 per cent. as regards the real effective (*Iststärke*) mentioned above, and of 53.93 with the Budgetary effective (*Sollstärke*) which was, according to the *Friedens-Besoldungsetat*, 101,637 horses.

This last proportion is an increase over the preceding year, when it stood at 53.02 per cent., and it has been increasing since 1898. There were 6,389 more cases in 1909 than in 1908, which corresponds to a percentage of 6.29 of the Budgetary effective and to 5.82 per cent. of the real effective. One of the reasons for this increase is that, for the first time this year, there have been included in the statistics, the two Saxon Army Corps (XIIth and XIXth) which have supplied, for their part, 4,775 sick horses.

The increase is mainly due to an important recrudescence of some epidemic maladies, especially influenza and erysipelas; diseases of the genital and urinary organs, of the skin and epidermis, and of the hoofs have also increased; the other groups of diseases have, on the other hand, decreased in comparison with 1908.

The cases of illness are divided as follows over the four quarters of the year:

1st Quarter	11,128
2nd ,, ...	12,792
3rd ,, ...	21,585
4th ,, ...	11,544

As is always the case, it is the third quarter, during which the manœuvres take place, which furnishes the greatest number of cases.

From the point of view of the absolute number of horses under treatment, the highest place is taken by the XIVth Corps with 3,989 cases, and the lowest by the XIth Corps with 1,613; the mean being 2,704 cases per Army Corps.

If one takes count of the Budgetary effective, the classification of the Corps and Establishments is as follows:—

	Percentage
Institute of Military Equitation	73.26
XIIIth Corps	70.24
IVth ,, ...	64.70
XIVth ,, ...	64.14
XVth ,, ...	61.17
VIth ,, ...	57.76
VIIth ,, ...	55.62
XIIth ,, ...	54.76

Germany—continued.

	Percentage.
XVIth Corps	51.81
IInd „	50.88
Vth „	49.23
VIIIth „	47.01
Xth „	46.88
XVIIth „	46.73
XIXth „	46.31
IXth „	45.33
Guard	45.32
XVIIIth „	41.88
IIIrd „	38.47
XIth „	37.93
Ist „	37.75
Field Artillery School of Firing	28.83

The 54,771 cases are distributed as follows under the different Arms of the service.

	Cases.	Percentage.
Cavalry	34,275	60.69
Field-Artillery (including School of Firing) ...	15,508	42.47
Train	2,295	47.28
Groups of Draught Teams of Foot—		
Artillery (including School of Firing)	988	67.81
Machine-gun Detachments	393	43.57
Other Horses	1,252	40.34

It is interesting to note the considerable differences existing in the different branches of the Cavalry, which show as follows:

	Horses.	Cases.	Percentage.
Cuirassiers	8,351	3,809	45.61
Uhlans	16,903	9,774	57.82
Mounted Jägers...	3,539	1,836	51.87
Dragoons	13.663	11,123	81.41
Hussars	14.029	7,733	55.12

Of the 54,711 horses under treatment in 1909 there were:

	Horses.	Percentage.
Completely cured...	50,512	92.32
Rendered fit for service	951	1.73
Cast	365	0.66
Died	1,349	2.46
Killed	420	0.76

While 1,114 horses still remained under treatment on 31st December.

The largest proportion of the diseases was due to injuries of the limbs, then to diseases of the epidermis and skin, next those of the digestive organs then of the hoofs and finally contagious diseases.

Revue Militaire des Armées Etrangères.

Germany.

***Recruiting Statistics of the German Army in* 1909.**—The Recruiting Report for 1909, issued on the 10th October last, gives the following results:—

The number of young men who came before the Boards of Revision (*Conseils de Revision*) in 1909, was 1,226,730[1] made up as follows:—

	1909	*Increase as compared with* 1908
Young men of 20 examined for the first time ...	534,310	+ 7,030
Young men of 21	361,759	+ 4,636
„ „ „ 22	283,674	+ 14,242
„ „ above	46,987	+ 2,633
Total	1,226,730	+ 25,541

The classification of the young men, inscribed on the recruiting lists in 1909, was as follows:

	1909	*Increase or diminution as compared with* 1908
Excluded from Service	856	+ 20
Unfit for Service	34,890	+ 757
Put back	703,164	+ 18,967
Young Men of 20 or over, who have engaged as Volunteers before the date of their formal calling up	37,253	+ 1,015
Young Men Enrolled in the *Landsturm* (1st Ban) ...	138,364	+ 9,476
Young Men Enrolled in the Ersatz-Reserve of the Active Army	93,662	+ 1,017
Young Men Enrolled in the Active Army	218,541	+ 3,314
Total	1,226,730	

(A) Enrolled in the *Landsturm* (1st Ban.):—

1. On account of their civil station	460	138,364
2. Supernumerary (*Uberzählige*)[2]	92	
3. For divers reasons, principally for deficient physique	137,812	

(B) Enrolled in the Ersatz-Reserve of the Army:—

1. On account of their civil station	7,420	91,123
2. Supernumerary *(Uberzählige)*	4,115	
3. For divers reasons, and Medium constitution ...	79,597	

[1] In this number are not included the *insoumis* (the young men who fail to join at the proper time), and those who cannot be found, of which the number is no longer given in the official documents. The last time these men figured in the Official Return was in 1902, when they were shown as 130,000.

[2] The young men classed in this category are those who have been passed as fit for service in the active Army and are liable to be called to the Colours in case of an unforeseen deficit in the men drawn for the active Army.

Germany.

(C) Enrolled in the Ersatz-Reserve of the Navy:

1. On account of their civil station	65	2,530
2. Supernumerary (*Uberzählige*)	5	
3. For divers reasons, and a mediocre constitution ...	2,460	

(D) Enrolled in the Active Army:

1. Active Army	Incorporated for 1 year (Train)	2,138	218,541
	„ „ 2 „	190,588	
	„ „ 3 „	12,306	
2. Non-Combatants		2,730	
3. In the Navy		10,779	

From the point of view of age, the young men incorporated in the Army and Navy, are classed as follows:

The numbers of Volunteers who engaged in 1909 were:

Young men of 20 years of age	100,721
„ „ 21 „ „	54,078
„ „ 22 „ „	61,734
„ „ over 22 „ „	2,008
Total	218,541

59,521 in the Army;
4,192 „ „ Navy.

These Volunteers were classed as follows:

1. One Year Volunteer s(*Einjährige*):		
Under 20 years of age	1,515	12,383
Of „ „ „	10,868	
2. Teachers and Candidates for the duties of public instruction not included in the preceding category:		
Under 20 years	6	1,024
Of „ „	1,018	
3. Other categories (two and three-year Volunteers):		
Under 20 years	22,790	46,114
Of „ „	23,324	
Total		59,521

The number of One-Year Volunteers enlisted in the Navy was 930, other categories, 3562,

Making a Total of 4,492

The total number of young men entered in the Active Army and Navy is then:

	1909.	*Increase or decrease as compared with* 1908.
Land Forces.		
Men incorporated	207,762	267,283 – 302
Men of 20 years or over who have engaged as Volunteers before date of formal calling up ...	35,210	
Engaged Volunteers under 20	24,311	
Navy.		
Men Incorporated	10,779	15,271 – 521
Engaged Volunteers	4,492	
Total ...		282,554 – 823

Germany.

The Comparative examination of the Official Recruiting Returns for 1909 and preceding years, gives the following results:

1. The number of young men inscribed on the Recruiting lists increases regularly; it has grown from 10,105,816 in 1905 to 1,226,730 in 1909, showing an increase of 120,914 in four years;

2. The number of young men incorporated annually in the Active Army has remained stationary since 1893, that is to say, since the Two-years service in the German Army came into force. It follows that the annual numbers of the incorporations not having followed the regular movement of increase in the population of the Empire, the peace effective of the Army does not represent more than 0.93 per 100 of the total population, whilst the Law of the Constitution of the Empire of 16th April, 1871, fixed it in the proportion of 1 per 100. The Military press therefore is constantly quoting this discrepancy as an argument for obtaining in the approaching Quinquennial a considerable increase in the Budgetary effective:

3. The number of young men put back increases rapidly each year;

4. The number of Volunteers who have engaged increases regularly. The total was 51,547 in 1905, which shows an increase of nearly 8,000 during the past four years. The number of One-Year Volunteers has increased from 10,464 in 1905 to 12,383 in 1909.

Physical Value of the German Contingents.—For some years, public opinion in Germany has been showing considerable apprehension at the way in which the population of the Empire is gravitating towards the great industrial centres and at the rapid increase of the urban as compared with the country population.

By order of the Chancellor an Appendix has been attached to the official recruiting returns since 1903, in which details are given separately of the results obtained by the two sources of recruiting, viz., the urban centres with over 2,000 inhabitants, on the one part, and the country on the other. The total number of young men examined by the Recruiting Boards (*abgefertigte*), exclusive of those put back, has grown, as regards the town-bred young men, from 194,710 in 1903 to 231,924 in 1909, an increase of about 19 per cent., whilst the corresponding number of youths from the country, during the same period, has increased from 298,785 to 318,402, an increase of only 6 per cent.

But the recruiting and value from these two sources are very different. For the year 1909, while the proportion of young men passed as fit for the Active Army (*Taugliche*), with the number of young men examined and not put back (*Abgefertigte*), is 57 per cent for the recruits coming from the country, it is only 49 per cent. for recruits coming from the urban centres.

Moreover, from the statistics given below, it is seen that the number of men discharged from the active service—after incorporation—for weakness or infirmities, is increasing regularly.

Out of 100 men of the incorporated effective, there have had to be discharged:

	Unfit for Service.	*Invalided.*	*Total.*
1883—1888	2.1	1.0	3.1
1888—1893	2.1	1.4	3.5
1893—1898	2.4	1.7	4.1
1898—1903	2.4	1.8	4.2
1903—1908	2.6	1.9	4.5

Germany.

Without wishing to draw hasty conclusions from the above statistics, it yet would seem that the rapid increase of the population of the large German towns, is having its influence on the quality of the annual contingents and may, in the long run, diminish their military value.

This is the reason why the German Government attaches such great importance to the protection of the rural populations and the solicitude for this protection often explains the internal policy of the Empire.

Revue Militaire des Armées Etrangères.

Mexico.

Military Schools: The Military College at Chapultepec.—On the nearest hill to the capital (Mexico), on the same spot where formerly stood the Palace of the Aztec Emperors now stand the buildings of the Military College of Chapultepec adjoining the summer residence of the President of the Republic. Here 285 pupils receive their military education, which, judging from the time taken to acquire it, ought to be of a very thorough character.

The entry to this College at Chapultepec is by competition at the age of 16, the sons of old soldiers being allowed to join a year younger.

Every year 80 pupils join the College after signing an agreement to serve in the Mexican Army when they leave the school, for four years if they join the Infantry or Cavalry, for seven years if appointed to the Engineers, the Staff or the Artillery.

The number of officers gazetted as the result of the passing out examinations is about 60 per annum. Of this number, about 35 have completed three years of study and are appointed to the Infantry or Cavalry; the remainder, some 25 in number, complete seven years of study and are then appointed to the Staff, Engineers or Artillery.

The education is free, but in case of dismissal during the course, as the result of misconduct or incapacity, the two persons of position, who have before the admission of the pupil guaranteed his intelligence and character, have to pay the expense of an education which, being incomplete, is of no benefit to the State.

At the head of the College is placed a General of Brigade, the post being filled at present by Major-General Beltran, with Colonel Rocha as his second in Command.

The Staff of the School consists of 75 officers or civil professors, who have charge of the classes, the lectures and the theoretical and practical courses of instruction.

The terms commence on the 8th January, finishing on 22nd September. During the School year, the pupils are placed in small classes (always with less than 25 scholars), and grouped as far as possible so that youths of the same mental capacity may be together.

To obtain an idea of the methods of instruction and the results obtained, it is necessary to distinguish between the two very different categories of courses, viz., those pursued by all the pupils during the first three years and those reserved for the pupils intended to go through the special courses.

Mexico.

During the first three years every effort is made above all to train the mind of the young officer. Although physical exercises, equitation, gymnastics, swimming, fencing and sword exercise occupy a prominent place in the instruction given at Chapultepec, the pupils nevertheless have to undergo heavy brain work.

The young sub-lieutenant leaving Chapultepec will have acquired during his three years of study a theoretical instruction almost equivalent to that of our Bachelor of Arts and a practical knowledge equal to that of a good French non-commissioned officer of Artillery.

Very different is the instruction given to the future officers of the special corps.

During the four extra years at the College, numerous opportunities are given them of carrying on their personal studies, and practical exercises occupy a large place in the employment of their time. Finally during the year which elapses after they leave the College before appointment to their Corps they are detached on different services, where they complete their special instruction. Thus, the officers of the staff, to quote only those, are attached during January, February and March of the year after they leave Chapultepec, to the "Geographical Commission of Mexico; during April, May and June to the Goedetic Commission; during July, August and September they make under a professor a tour of geographical and military survey. The month of October is left to themselves to enable them to work out some theme dealing with a plan of operations affecting the Mexican Army.

Thus although coming from the same school, the officers of the Mexican Army had, even before the School for "Aspirants" was created, a double origin: those who remained three years at Chapultepec and those who had followed for 8 years their studies in that establishment with the view of joining one of the special Corps.

A complaint has often been made that the first-named continue their careers without enthusiasm and sometimes merely for the pay, and that the second do not sufficiently interest themselves in military questions and that they leave the Army as soon as their 7-years term of engagement is over, in order to profitably employ in civil enterprises the education they have received at the Military College. Finally the objection is made with regard to the last mentioned class that they remain eight years at the Military School without being brought into any touch with the Army.

The Military School for Aspirants at Tlalpam.—This School, which was only formed in 1905, is intended to train subaltern officers for the infantry and cavalry. At its head has been placed a colonel of cavalry, Colonel Miguel Ruelas, an officer of distinction, to whom is due, if not the idea of creating the School, at least all the details of its organisation.

The number of the pupils at the School is 210; they enter at the age of from 17 to 21, and the length of the course is 2 years. There are actually at Tlalpam three classes of pupils: first, those who, after passing an examination, enter the school directly from civil life; secondly, officers who have joined the active Army, having also been promoted directly from being civilians; and, finally, non-commissioned officers from the Army, who complete their training at Tlalpam before promotion to the rank of sub-lieutenant.

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Very different is the instruction given to the future officers of the special corps.

During the four extra years at the College, numerous opportunities are given them of carrying on their personal studies, and practical exercises occupy a large place in the employment of their time. Finally during the year which elapses after they leave the College before appointment to their Corps they are detached on different services, where they complete their special instruction. Thus, the officers of the staff, to quote only those, are attached during January, February and March of the year after they leave Chapultepec, to the "Geographical Commission of Mexico; during April, May and June to the Goedetic Commission; during July, August and September they make under a professor a tour of geographical and military survey. The month of October is left to themselves to enable them to work out some theme dealing with a plan of operations affecting the Mexican Army.

Thus although coming from the same school, the officers of the Mexican Army had, even before the School for "Aspirants" was created, a double origin: those who remained three years at Chapultepec and those who had followed for 8 years their studies in that establishment with the view of joining one of the special Corps.

A complaint has often been made that the first-named continue their careers without enthusiasm and sometimes merely for the pay, and that the second do not sufficiently interest themselves in military questions and that they leave the Army as soon as their 7-years term of engagement is over, in order to profitably employ in civil enterprises the education they have received at the Military College. Finally the objection is made with regard to the last mentioned class that they remain eight years at the Military School without being brought into any touch with the Army.

The Military School for Aspirants at Tlalpam.—This School, which was only formed in 1905, is intended to train subaltern officers for the infantry and cavalry. At its head has been placed a colonel of cavalry, Colonel Miguel Ruelas, an officer of distinction, to whom is due, if not the idea of creating the School, at least all the details of its organisation.

The number of the pupils at the School is 210; they enter at the age of from 17 to 21, and the length of the course is 2 years. There are actually at Tlalpam three classes of pupils: first, those who, after passing an examination, enter the school directly from civil life; secondly, officers who have joined the active Army, having also been promoted directly from being civilians; and, finally, non-commissioned officers from the Army, who complete their training at Tlalpam before promotion to the rank of sub-lieutenant.

Mexico.

The Staff of the School consists of 37 officers. One of these is a French officer from the Cavalry School at Saumur, who resigned and now performs the duties of Instructor in Equitation at the School. Fencing, swimming, equitation, manœuvres, field works, fortification and musketry occupy the greater part of the time spent at the School.

The question is asked what influence will it have on the recruiting of the Mexican Officers Corps. It may be noted that the School is held in high esteem by the heads of the Army and that the commanders of regiments have expressed themselves quite satisfied with the first sub-lieutenants who have joined from Tlalpam.

No regulation at present permits the selection of officers from the School of "Aspirants" for entry to the Military College at Chapultepec to follow the extra four years' course for the special corps, but the Minister of War's attention has been drawn to this omission and as the Commander-in-Chief of the Army is in favour of a modification in this direction of the rules which govern both the College and the Military School, it is probable that the necessary change will be made in the near future.

Revue Militaire des Armées Etrangères.

Russia.

The following interesting translation from the *Tver Gazette* has been kindly forwarded to us by Captain G. A. West, late R.F.A., His Britannic Majesty's Vice-Consul at Archangel.

The original article is headed:—

IN MEMORY OF AN UNNOTICED RUSSIAN HERO.

(On the occasion of the transfer of Private Riaboff's remains to his native land.)

On the 7th October, 1904, one of our advanced Cossack patrols, whilst reconnoitring the enemy's movements, noticed in a conspicuous place under a stone by the side of the road, a piece of paper in which was wrapped an ordinary envelope addressed in Russian handwriting: "To the Russian Army Operating in Manchuria, from the Japanese General Staff."

The envelope was opened in the Staff of the Manchurian Army, and inside was found the following letter, also in quite grammatical Russian:—

"The reservist, Basil Riaboff, age 33, of the volunteer detachment "of the 284th (Chembarsk) infantry regiment, a native of Lebedeff "in the province of Penzensky, was taken prisoner by our soldiers "on the 27th September last within our advanced lines in the disguise "of a Chinese peasant. According to his own statements, it appeared "that he had been sent at his request to spy on the position and "movements of our army, and that he came within our lines on "27th September by the station of Pantai going in a S.E. direction. "After the matter had been investigated, Riaboff was sentenced to be "shot. The sentence was carried out on 30th September.

Russia

"In bringing this incident to the knowledge of the Russian "Army, our army cannot refrain from expressing its sincerest wish "that the latter respected Army brought up more warriors of so really "fine a stamp and so worthy of all respect as the above-mentioned "Riaboff. On being asked if he had anything to say before he died, "he answered: "I am ready to die for my faith, my Czar and my "country." When we expressed to him. "We quite enter into your "situation and promise to try and convey to your parents, wife and "children how you so bravely and resolutely went on a death-errand "for Czar and country, and if there is anything that we can tell "them from you, it will be said." He answered, unable to restrain his "tears: "Many thanks, tell them what happened." Then crossing "himself, he prayed long, kneeling to the four corners of the earth, "and was quite firm in his bearing to the last.

"Those who witnessed the scene could not prevent hot tears from "falling. Sympathy for this genuinely brave and exemplary soldier, "whose mind was entirely filled with a feeling of his duty, exceeded "all bounds."

The Russian newspaper goes on: "What further commentary is needed to this testimony of the greatness of the Russian soul, given by the enemy himself. Yea, let us always remember the exploit of this simple Russian peasant, making himself known to us quite by chance, thanks only to the impression he made on our foes. . . . . Ah! and how many such deeds passed unnoticed."

Turkey.

Staff School of Yldiz (Erken Harb Mekter). — This school is both a Staff School and a school for the higher branches of military studies. All the officers who pass out of it do not re-enter the cadres of the General Staff; some among them, considered unfit for this service, rejoin their regiments.

The school is placed under the command of a Lieutenant-Colonel of the General Staff, who is charged with all the details of instruction and administration, and who reports directly to the Grand General Staff, for whose approval he submits all his proposals, &c.

The length of the course is for three years. The students of each year form a division.

The students are admitted to the school (since 1909) as the result of an examination, principally in tactics and French. In 1910 fifty-five candidates presented themselves, twenty-six of whom were received. Before the institution of the entry examination, there were forty of the senior pupils of the Military School at Pancaldi, who, when they left, entered the Staff School.

For the future there will be admitted to compete, only officers who have passed at least two years in regimental duty and not above the rank of captain. From one year to another a selection is made for return to regimental duty, as also on leaving the school.

The examinations at the end of the year, followed each time by a classification, commence at the end of June and finish towards the middle of July; they are not followed by any vacations.

Turkey

The students of the first and second divisions are sent up to the 1st October (the date of their return) to a regiment of an arm differing from their own, where they do not exercise a command, but are placed as assistants to the commander of a unit or to a lieutenant; they take part in the Autumn Manœuvres.

The students of the third year carry out a staff ride, under the leadership of the commandant of the school, with the assistance of their professors. This trip lasts fifteen days.

The following is the course of studies pursued:—Tactics and staff work, military history, siege war, fortification, science of arms, strategical geography, topography and geodesy, naval war, political history, international law, living languages (French, German, Russian). — *Revue Militaire des Armées Etrangères.*

Reserve Officers.—A new law affecting officers of the Reserve was promulgated in July last (the year of the Hegira 1326). Its application opens a new era for the Ottoman Army.

Up to the present all the cadres of the Reserve formations have been constituted with officers of the active Army. They were grouped in regiments stationed in the centre of their mobilisation district. This organisation had the advantage of facilitating the placing on a war footing but it was, on the other hand, extremely expensive since it entailed the maintenance of 42,000 officers in time of peace; and, in addition, nearly half of this considerable cadre lost much of their power to handle troops by their forced inactivity.

For the future, the officers of the Reserve will take up some of the duties of their rank in the mobilised formations of the Reserve. Their presence will render disposable a certain number of officers of the active Army, which will allow of the relief of the cadres, and of the increase (projected) of the active Army.

There is nothing particularly original in the provisions of the law voted by the Ottoman Parliament. They are very similar to those to be found in other armies.

The officers of the Reserve will be drawn from the following sources: 1. Officers of the different branches of the Army who retire. 2. Men who during their period of service have received a special course of instruction and education. These are:—

1. Officers who have served at least ten years in the active Army and passed an examination of fitness;
2. Old pupils of the higher schools who have completed a year of service, during which they shall have received a special training;
3. Old pupils of the *Lycées* and Colleges (*idhadies*) and of the primary higher schools (*ruchdiés*), who have completed in the first case two years, and in the second three years of service and received a special training.

Reserve officers coming from the officers of the active Army who have distinguished themselves in time of war can, if they demand it, be reinstated in the active Army, under the condition that the age regulations will be respected and on the recommendation of a special commission composed of their commanders.

Officers of the Reserve coming from the active Army may be employed in time of peace in certain duties at the Ministry of War in the offices, depôts, military schools, &c., exclusive of the post of commandant.

No non-commissioned officer or man can be promoted to be officer of the Reserve unless he has obtained a certificate stating that he possesses the necessary qualifications, given by the officers of the regiment in which he has served.—*Revue Militaire des Armées Etrangères.*

United States.

Annual Report of the Chief of the Staff. — Though it covers a period during which he was not in command, the annual report of the Chief of Staff is signed by Major-General Wood, in accordance with the custom established in the past of having the report signed by the officer performing the duties of Chief of Staff at the date on which the report is submitted. The report states that the appropriations have not been sufficient to permit much new construction or to continue construction already begun. For the insular possessions the appropriations were sufficient to make good progress toward the completion of fortifications. The satisfactory progress toward the completion of the fortification of home ports has been impracticable. The number of guns and emplacements in our fortified harbours at home is ample, if not more than ample, for the defence of those harbours, but fortifications are required at such an important point as the entrance to Chesapeake Bay, now wholly undefended.

One of the most serious matters confronting the War Department at this time is the question of reserve ammunition and supplies. We have accumulated a considerable supply of small arms and small-arms ammunition, but we are sadly deficient in the reserve supply of field artillery and field artillery ammunition and of reserve seacoast ammunition. The existing want of field artillery guns, carriages and ammunition constitutes a grave menace to the public safety in case of war.

Not only is the actual shortage of officers greatly felt, but due to the constant detachment of officers from their commands it is necessary to continually shift the duties of those remaining, and this tends to still further demoralise the discipline and instruction of the troops. Every effort has been made to reduce the number of officers on detached service, and no active officer is detailed before a careful study has been made of all available retired officers. Permanent relief can be afforded only by the enactment of a law authorising an increase of officers. The bill now pending before Congress for raising a Volunteer Army in time of war is believed to be as nearly perfect as can reasonably be expected. If the bill becomes a law it will be possible to make detailed plans for carrying it into execution in the event of war, which is impossible at present.

United States.

The strength of the Organised Militia is 119,660 officers and men, an increase of 734. Under the operation of the new Militia law military efficiency has continued to improve. There is great variation in the matter of instruction and training. The short school of instruction is an excellent means to prepare the company officers, but it does not reach the higher officers, and must be supplemented by field work requiring mobilization and manœuvres. No satisfactory progress can be had in the instruction of the Organised Militia until some provision is made by Congress for placing an adequate number of officers and non-commissioned officers of the Regular Army on duty with them. There should be one senior officer on duty at each State headquarters, and there should be at least one commissioned officer of junior rank to each regiment of Infantry, each squadron of Cavalry, and each battalion of Artillery, assisted by one non-commissioned officer of the Regular Establishment for each company, troop and battery of the Militia. It is intended to carry the organisation of a joint Regular and Militia force for national defence one step further by the actual mobilisation of at least one division of the 1st Field Army. This is a Field Army only in name, as supply of war material is so deficient that its complete organisation and equipment is, under present conditions, impossible without great delay. Because of the lack of suitable armoury equipment for the instruction of Coast Artillery reserves, enthusiasm is falling off, the movement to provide the United States with an adequate coast defence reserve from the Organised Militia is being checked and much of the ground gained is being lost. Suitable armouries are essential to the efficient training of the Militia. One of the most flagrant deficiencies in this matter of armouries is to be found in the District of Columbia. In the Cavalry and Field Artillery the difficulty of providing horses renders satisfactory training next to impossible, and the United States should furnish forage for horses that the States provide strictly for military purposes. The approximate annual cost of such a plan would be 400,000 dollars. The Field Artillery is specially in need of this assistance from the National Government. Because of the absence of this assistance the instruction of this arm is far from satisfactory. Indeed, with the exception of a few batteries, it is wholly unprepared for service. The gravity of this situation becomes evident when it is remembered that in both the Regular Army and the Militia the Field Artillery falls far below its proper proportion with respect to the other arms. The report of the target season of 1909 shows great improvement, but there is still too much time and money expended in qualifying marksmen for higher classification to the neglect of the larger part not yet qualified as marksmen. The present Militia law contains a number of defects, bearing principally upon the manner in which the Militia shall be brought into the service of the United States at the outbreak of war, and it is deemed to be of the greatest importance that it should be so clearly drafted that it will be thoroughly understood by all. Thus the Department will be able to know in advance exactly what Militia and the character of the Militia it can depend upon in the event of war. Nothing should be left for the last minute, and everything possible should be done in advance to expedite the action of the War Department at the proper time if the stress of war should come.

United States.

Mobile Army.

The Infantry is already severely taxed by its present duties, and in order to furnish the Infantry troops needed for the small garrisons at present maintained in our insular possessions and Alaska, it has been necessary in some instances to diminish the Infantry garrisons and in others to abandon posts. The increased demands which will be thrown upon the Army incident to providing an adequate garrison for the Hawaiian Islands and the Canal Zone, in addition to maintaining a reasonable force of Infantry in the United States, will render a very considerable increase in the Infantry arm necessary.

Reorganisation of the Cavalry is a matter which demands attention, with a view to securing a regiment which is tactically better suited to the conditions of modern war than is our present regiment.

The existing deficiency in the Field Artillery constitutes one of the greatest menaces to our country in case of war. If the present Regular Army and Organised Militia, at war strength, were called to arms to-day, there would be a shortage of over fifty per cent. in the field artillery necessary to equip them. As this force would only represent a portion of the force called to arms in case of war with a first-class Power, the gravity of the situation becomes at once apparent. Our reserve of field artillery is insignificant in comparison with the demands which would be made upon it in case of war, and at the present rate of progress it will be over fifty years before an adequate reserve supply of field artillery of all kinds is accumulated.

Conditions in the Coast Artillery Corps in all which concerns personnel are very satisfactory, and steady progress has been made in theoretical and practical work. The instruction of the Coast Artillery of the Organised Militia is progressing with a fair degree of rapidity in the North Atlantic seaboard districts, and will be much accelerated when proper armoury equipment has been furnished. The great reduction in appropriations has delayed the completion of important sea coast defences and the installation of very necessary equipment, especially searchlights and fire-control systems.

It is imperatively necessary that steps should be taken to organise a proper reserve. Steps should be taken looking to the organisation into a reserve of men who are discharged from the Regular Army and the Organised Militia. These men should receive a small monthly pay, and in return should keep the War Department informed of their address, and should be required to attend the annual manœuvres, receiving while on this duty full pay. This would result in, within ten years, a reserve consisting of not less than 300,000 men who have served in the Regular Army or Militia.

General Remarks.

Attention is invited to the urgent necessity for greater concentration in post and barrack construction. The present comparatively small garrisons are scattered over large areas, involving the care of large extents of ground and the upkeep of roads, walks, sewers, &c., all of which have tended greatly to increase the cost of the maintenance of troops.

United States.

The present remount system is proving very satisfactory. The quality of mounts has greatly improved, and it is believed that the system as at present used should be continued, as it ensures, within a very few years, a most excellent mount for the entire Service.

The necessity for a General Service Corps has been emphasised in the annual reports of division and department commanders and staff officers for years. Its establishment is to be desired, from the standpoint of economy, efficiency, and discipline.

It is the concensus of opinion in the Army that the canteen should be re-established. This opinion is concurred in by the Chief of Staff.

It is believed that inspections by division and department commanders should be more frequent and extensive than heretofore and that they should involve a thorough trying out of the troops in practical problems and practical field work, and that officers' rating as to fitness for promotion should rest largely upon the efficiency of their commands as shown by these inspections and those made by the officers of the General Staff and the Inspector-General's Department.

In view of the very rapid advance made in aeronautics in the last few years and the imperative necessity for aeroplanes and dirigibles in war it is important that adequate appropriations should be made available in order that the Signal Corps may be provided with a reasonable number of the better type of machines for instruction purposes and field work. The Signal Corps is, as now organised, insufficient to properly perform its present duties, and as the development of aeronautics will undoubtedly throw added work on this corps, attention is invited to the necessity for its increase.—*Army and Navy Journal.*

NAVAL AND MILITARY CALENDAR.

FEBRUARY, 1911.

1st (Wed.) Launch of H.M.S. *Thunderer* from the Thames Shipbuilding Co.s. Yard, Blackwall.
2nd (Thurs.) Arrival of 1st Bn. Yorkshire Regiment at Khartoum.
3rd (Fri.) H.M.S. *Diana* paid off at Devonport.
4th (Sat.) H.M.S. *Diana* recommissioned at Devonport for Mediterranean.
5th (Sun.) 1st Bn. King's Own Scottish Borderers embarked at Port Soudan for Bombay, per *Dongola*.
9th (Thurs.) 1st Bn. South Staffordshire Regiment embarked at Devonport for Gibraltar per *Plassy*.
10th (Fri.) H.M.S. *Diana* left Plymouth for Mediterranean.
13th (Mon.) Fiftieth Anniversary of the capture of Gaeta by General Cialdini and the surrender of King Francis II, of Naples and his family.
" " 1st Bn. King's Own Scottish Borderers arrived at Bombay.
" " 1st Bn. South Staffordshire Regiment arrived at Gibraltar.
14th (Tues.) Launch of H.M.S. *Dartmouth* from Vickers and Co.'s Yard at Barrow.
" " 2nd Bn. Norfolk Regiment embarked at Gibraltar for Bombay per *Plassy*.
15th (Wed.) 2nd Bn. South Staffordshire Regiment arrived at Southampton from Durban per *Soudan*.
24th (Fri.) H.M.S. *Indefatigable* commissioned at Devonport for First Cruiser Squadron.
25th (Sat.) 1st Bn. Scots Guards embarked at Southampton for Egypt per *Soudan*.
27th (Mon.) 1st Bn. Northamptonshire Regiment embarked at Aden for Devonport per *Dongola*.

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NAVAL.

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Revue d'Histoire. Paris: February, 1911.—"The Campaign of 1908-09 in Chaouïa" (*continued*). "The Recruiting in the Landes from 1789 to 1798" (*concluded*). "The Manœuvre of Pultusk" (*continued*). "Ideas of Napoleon on the Defence of Italy in 1809." "The Campaign of 1813: The Preliminaries" (*continued*). War of 1870-71: The First Army of the Loire" (*continued*).

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GERMANY.—*Militär-Wochenblatt.* Berlin: 2nd February, 1911.—"The Pursuit in the Frederickian and later Wars." "On Manœuvre Problems." "Of the English Army: The Year, 1910." "From the Chaouïa Plain." 4th February.—"General of Infantry von Montbé: Obituary Notice." "The Battle of the Hallue." "The Pursuits in the Frederickian and later Wars" (*concluded*). "The English Army" (*concluded*). 7th February.—"Marcher Au Canon." "News of the Turkish Army." "On the Isolation for Infection of Horses with the Murrain." 9th February.—"Scouting Service of the Cavalry Division." "Marcher Au Canon" (*concluded*). "News from the Austro-Hungarian Army."

"Of the Bulgarian Army." 11th February.—"Lance or Sabre." "Near Scouting before and in Battle." "The Introduction of Universal Service in England." "The Experimental Battalion of the French-Senegalese Rifles in South Oran." 14th February. — "On the History of the Campaign of 1866." "A hundred and fifty years ago: The Winter Campaign of Duke Ferdinand of Brunswick in Hesse and the Battle of Langensalza on 15th February, 1761" (*continued*). "Aiming and Firing of the Belgian Field-Artillery." "Near Scouting before and in Battle" (*concluded*). 16th February.—"The Mounting of Officers." "The Machine-gun Detachments of the French Infantry." "A hundred and fifty years ago" (*continued*). "The Military-Technical Review: New Airships." 18th February.—"The new Explosives Regulation." "The Fall of Belfort." "Something on the Observation-car of the Field-Artillery." 21st February.—"The Boer War and its Tactical Lessons according to English and German Conceptions" (*continued*). "Scouting Service of the Cavalry Division." "Field-Artillery in Advanced Positions." "The New Explosives Regulation" (*continued*). "The New Organisation of the Norwegian Army." 23rd February.—"The New Explosives Regulation" (*concluded*). "The Boer War and its Tactical Lessons according to English and German Conceptions" (*continued*). 25th February.—"The Entry-Examination for the General War Schools in 1810." "The Boer War and its Tactical Lessons according to German and English Conceptions" (*continued*). "France's Foreign Legion." 28th February.—"A Reminiscence of the 1st March, 1871." "Something of the French Army." "The New Organisation of the Norwegian Army" (*concluded*).

Jahrbücher für die Deutsche Armee und Marine. Berlin: February, 1911.—"On Military Proposals." "Physiological Phenomena in Fortress War on the basis of the Fighting round Port Arthur." "Napoleon the Leader as a Judge of Men." "On the Decline of Discipline in the Russian Army." "On the Cone of Dispersion of Projectiles." "Fire and Drill." "The Breakdown of the Military System of the Netherlands as it has existed up to the present."

Artilleristische Monatshefte. Berlin: January, 1911.—"New Study on Schrapnel." "Howitzers and Guns in Field War." "Schematic Summary of the Work of the Battery Leader in Covered Positions." "Fire Distribution." Remark on the Essay: "Empiric Formulas for the Determination of the Movement of the Projectile in Flight."

ITALY.—*Rivista di Artiglieria e di Genio.* Rome: January, 1911. —Has not yet been received.

Rivista Militare Italiana. Rome: February, 1911.—"Defence against possible Aeronautical Attacks." "Remarks on the Composition and Employment of Infantry Machine-gun Sections." "The Dream of Lieutenant Orsenti." "The Battle of Francavilla." "Discourses of Frederick II. of Prussia." "Desertion in the U.S. Army." "Artillery School of Firing." "Ideas on the Recruiting, Organisation of Cyclists." "Field Signalling."

SPAIN.—*Revista Técnica de Infanteria y Caballeria.* Madrid: 1st February, 1911.—"Evolution of Military Law Among Modern Nations" (*continued*). "Military Cyclism." "In Honour of Spanish Independence." "Judging Distance in the German Army." 15th February.—"The Organisation of the Spanish Army as Viewed by a Prussian" (*continued*). "The Evolution of Military Law Among Modern Nations" (*continued*). "Spanish Moorish Relations." "Military *Moral*."

Revista Cientifco y Bibloteca Militar. Barcelona: 1st December, 1910.—"Lessons of the Riff War" (*continued*). "The Army and Public Instruction." "Our Programme for 1911." 15th December.—"Lessons of the Riff War" (*continued*). "Recollections of the Italian Army." "Machine-guns in the English Army." "Military Statistics." January, 1911.—Has not been received. 10th February, 1911.—"Command of Machine-guns." "Recollections of the Italian Army" (*concluded*). "The Career of the Officer of the German General Staff." 25th February.—"The Napoleonic Poetical and Real Methods." "Appreciation of Distances." "The Employment of Armies in War according to Italian Principles." "Seniority of Officers in the Italian Army."

Revista de Caballeria. Madrid: February, 1911.—Has not yet been received.

SWITZERLAND.—*Revue Militaire Suisse.* Lausanne: February, 1911.—"Instruction of a Cyclist Company." "History of the Regiment of Swiss Guards in France." "Aviation." "A further Opinion of the Krupp Shrapnel-shell against the High-Explosive Ehrhardt-van Essen Shell."

UNITED STATES.—*Journal of the United States Artillery.* Fort Monroe, Virginia. January—February, 1911.—"The Selection and Defence of Naval Bases." "Investigation of Gasoline Engines with a view of determining their Suitability as a Source of Power for Coast Defence Installations." "Range Corrections from Observation of Fire."

NOTICES OF BOOKS.

The Life of Sir William Howard Russell, C.V.O., LL.D. The first special correspondent. **By JOHN BLACK ATKINS, London. John Murray, 1911. 2 Volumes.**

The British Army has had no better friend than the cheery Irishman whom thousands who never knew him called "Billy Russell," and his most interesting and amusing life should, and doubtless will, find a home in most military libraries.

Born near Dublin (a self-evident fact) on March 20th, 1820, the son of a Protestant father and a Roman Catholic mother, Russell had his own way to make in the world, and aided by a ready tongue, quick wits, a brain of no ordinary quality, a bold spirit, a warm and generous heart, and a keen sense of humour, the young Irishman gallantly and quickly struggled up the stony path that leads from poverty to success. Nothing indeed could have been much less promising than Russell's start in life. Shortly after his birth his father failed in business, and an expected legacy, poor Billy's first hope, failed to materialise "My Aunt Stanistreet," he writes in his inimitable way, "left me a sum of money in her will, but it could never be found anywhere else." The man who could be amusing on so tragic a subject was bound to succeed.

It was at the early age of sixteen that young Russell "commenced author." One day he saw a lark of unusual pattern. The poor bird had a tuft on its head, so Billy shot it, drew it, described it, and finally ate it. The drawing and description appeared in due course in the *Dublin Penny Journal*, and, funnily enough, initiated a discussion which has lasted to this day. No other crested lark has ever been seen in Ireland, and, as one of Russell's aunts unkindly remarked, "I dare say it was Jenny Osborne's parrot. It escaped last week."

In spite of all adverse circumstances Russell somehow picked up a good education, and his quick wits and a stroke of luck did the rest. The stroke of luck came just when it was wanted. Russell was twenty-one, without either money or profession, when a cousin came to Ireland to represent the *Times* at the Irish elections of 1841. This cousin, Robert Russell, wanted a staff of young fellows competent to write plain, trustworthy accounts of what they saw. He came to Russell. "You will have a pleasant time of it," he said, "if you will do the work, one guinea a day and your hotel expenses. Will you start next week?" So Russell started next week on the career that he made his own and pursued with a success that soon made him one of the best known men of his day.

Russell's letters from Ireland and the precocious knowledge of the world and descriptive power shown in them by the raw young Irishman gave him an assured position with the *Times*, but it was, of course, his brilliant services to the nation, as well as to his employers, in the Crimean War that made him famous. With no recognised position, and regarded with undisguised hostility by almost every officer of the expeditionary force, Russell's letters from the Crimea *not* only saved the situation and rescued the remnants of the Army from imminent destruction, but they so struck

the conscience of the nation that our soldiers who perished in their thousands before Sebastopol in the winter of 1854 were the last sent out by England to die in her service for the want of transport and supplies. That service alone shouldhave earned the undying gratitude of the Army to Sir William Russell.

Russell's Crimean experience naturally marked him out as the representative of the *Times* in the Indian Mutiny, but he arrived in India rather late in the day. The fierce struggle for existence of the first few months of the Mutiny was over. Lucknow was still besieged, but Delhi had been re-captured, and the Punjab was safe. All that remained was to stamp out the embers of rebellion and so to punish the guilty that the memory of the punishment should long remain. The chief danger was that severity might degenerate into indiscriminate cruelty, and it is to the credit of our national character that despite the terrible provocation this was rarely the case. Here again Russell did good service, recording the valiant deeds of our soldiers and supporting every suggestion of clemency. He was indeed a true Irishman, and perhaps a little too ready to sympathise with rebellion, as an Irishman is apt to be; but in all his writings Russell shows himself generous and fair-minded in intention, even when impulse occasionally led him to unjust judgments. Sir William Russell's later achievements as a war correspondent were in connection with the American civil war of 1861-62, where his truthfulness gave considerable offence; the Austro-Russian war of 1866; the Franco-German war of 1870-71; and the Zulu War of 1879. In this last campaign Russell's underlying prejudice against England made him perhaps a little too ready to believe stories to the prejudice of the British troops, but any error of this nature sinks into insignificance in comparison with his invaluable services to the Army. Sir William Russell, who received the well earned honour of Knighthood in 1895, lived to the age of eighty-six; his long and distinguished public services being fully recognised on his memorial tablet in St. Paul's Cathedral, whereon he is justly described as "the first and greatest of war correspondents." From humble beginnings Russell achieved by sheer force of character and ability a quite exceptional position in life. It is not too much to say that he was the best known and most popular man of his day, and that this celebrity and this popularity were worthily won. The life of Russell, which is a rich mine of instructive and amusing matter, has been edited with much skill, sympathy, and discretion by Mr. J. B. Atkins, himself already favourably known as a brilliant war correspondent and an essayist of great charm.

PRINCIPAL ADDITIONS TO LIBRARY, FEBRUARY, 1911.

Catalogue of the Pictures, Portraits, Engravings and Busts in the United Service Club, Pall Mall. Crown 8vo. (Presented.) (Thomas & Sons, Ltd.) London, 1911.

The Story of Majorca and Minorca. By Sir Clements R. Markham. 8vo. 7s. 6d. (Smith, Elder & Co.) London 1908.

Military Japan—The Japanese Army and Navy in 1910. By J. C. Balet. Translated from the French by C. A. Parry. Crown 8vo. 4s. (Kelly & Walsh, Ltd.) Yokohama, 1910.

The Life of Sir William Howard Russell, C.V.O., LL.D. The First Special Correspondent. By John Black Atkins. 2 Vols. 8vo. 30s. (John Murray.) London, 1911.

La Guerre Napoléonienne. By Lt.-Colonel Camon. 3 Vols. 8vo. 16s. 6d. (R. Chapelot et Cie.) Paris, 1903-07.

Quebec Under Two Flags. By A. G. Doughty & N. E. Dionne. Crown 8vo. 4s. (*Quebec News Coy.*) Quebec, 1903.

Pacific Blockade. By Albert E. Hogan. 8vo. 6s. (Clarendon Press.) Oxford, 1908.

The Evolution of Modern Germany. By W. H. Dawson. 8vo. 21s. (T. Fisher Unwin.) London, 1909.

Battle Honours of the British Army. By C. B. Norman. 8vo. 15s. (Presented.) (John Murray.) London, 1911.

Der grosse Krieg de Jetztzeit. Eine Studie über Bewegung und Kampf der Massenderre des 20 Fahrhunderts. By General Freiherr von Falkenhausen. 8vo. 8s. 6d. (E. S. Mittler und Sohn.) Berlin, 1911.

Etudes sur la Guerre. By Lt.-Colonel Montaigne. 8vo. (Presented.) Berger-Levrault.) Paris 1910.

Les Luttes Maritimes prochaines—Etats-Unis et Japan, Angleterre et Allemagne. By A. M. Laubeuf. 8vo. 1s. 3d. (A. Challamel.) Paris, 1908.

Memoires du Général Griois, 1792-1822. 2 Vols. 8vo. 11s. 3d. (Plon-Nourrit et Cie.) Paris, 1909.

Péril National. By Admiral Bienaimé and Lt. P. Collard. 8vo. 2s. (Librarie Universelle). Paris, 1905.

Le Haut Commandement dans les Principales Armées Européennes depuis les origines jusqu 'a nos jours. By Gaston Bodart. 8vo. (Presented.) Berger Levrault.) Paris 1910.

Organization—How Armies are formed for War. By Colonel Hubert Foster, R.E. 8vo. 3s. 6d. (Presented.) (Hugh Rees, Ltd.) London, 1911.

The India of the Future and its Defence. By Col. L. J. H. Grey, C.S.I. Crown 8vo. (Presented.) (William Clowes & Sons, Ltd.) London, 1911.

Three Rivers, the James, the Potomac and the Hudson—A retrospect of Peace and War. By General F. P. Farley, U.S.A. 8vo. 8s. (Presented.) (Neale Publishing Co.) New York, 1910.

Rear Admirals Schley, Sampson and Cervera—A review of the Naval Campaign of 1898, *in pursuit and destruction of the Spanish Fleet Commanded by Rear Admiral Pascual Cervera.* By Captain James Parker, U.S.A. 8vo. 12s. (Presented.) (Neale Publishing Co.) New York, 1910.

Travels from India to England; comprehending a visit to the Burman Empire and a journey through Persia, Asia Minor, European Turkey, etc., in the years 1825-26. By Major-General Sir James Edward Alexander. 4to. (Presented.) (Parbury, Allen & Co.) London, 1827.

The History of Prussia from the earliest times to the present day. Tracing the origin and development of her Military Organization. By Captain W. J. Wyatt. 2 Vols. 8vo. 9s. (Longmans, Green & Co.) London, 1876.

Handbooks of the Indian Army—Compiled under the orders of the Government of India—Pathans. By Major R. T. I. Ridgway, 40th Pathans. 8vo. 4s. 6d. (Presented.) Calcutta, 1910.

Famous Sea Flights from Salamis to Tsu-Shima. By John Richard Hale. Crown 8vo. 6s. (Presented.) (Methuen & Co., Ltd.) London, 1911.

The Danger Zone of Europe. By H. Charles Woods. 8vo. 10s. 6d. (Presented.) (T. Fisher Unwin.) London, 1911.

British Rights at Sea under the Declaration of London. By F. E. Bray. Crown 8vo. 1s. (Presented.) (P. S. King and Son.) London 1911.

Capture in War on land and sea. By Dr. James Wehberg. Crown 8vo. 5s. (Presented.) (P. S. King & Son.) London, 1911.

Sir William Butler. An Autobiography. By Lieut.-General the Rt. Hon. Sir C. T. Butler, G.C.B. 8vo. 16s. (Constable & Co., Ltd.) London, 1911.

The Outlines of Military Geography. By Colonel A. C. Macdonnell, R.E. 2 Vols. 8vo. 12s. 6d. (Presented.) (Hugh Rees, Ltd.) London, 1911.

RECENT PUBLICATIONS OF MILITARY INTEREST.

COMPILED BY THE GENERAL STAFF WAR OFFICE.

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PREFATORY NOTE.

This Pamphlet will be issued quarterly, in April, July, October and January. Its purpose is to draw the attention of Officers to British and Foreign publications of Military interest which are likely to assist them in their professional work. Copies o the pamphlet will be distributed to the Headquarters of Commands, Educationa Establishments, Units and Reference Libraries.

PART II.[1]

SECTION I.

NOTE 1. *When the Price is not given in Part II., Section I., it is not known.*

2. *In Part II., Section I., books whose titles are given in foreign languages as well as in English are published in those languages, and are not translated.*

AERIAL NAVIGATION.

The Defenders of Sevastopol [Севастополцы]. By General P. F. Rerberg. Vols. I, II, III. 418 pp. Profusely illustrated. Oblong 8vo. St. Petersburg, 1903, 1904, 1907. Golke and Vilborg.

In 1901, General Rerberg, of the Imperial Russian Engineers, a veteran of the Crimean War, announced his intention of compiling a representative collection of portraits of officers and men of all ranks who took part in the defence of Sevastopol. The collection is now completed and is dedicated to the defenders of Sevastopol. The three albums contain altogether 1,332 portraits, accompanied in most cases by a short biography of the individual; a number of these portraits date from the period of the Crimean War.

The collection includes photographs of Sevastopol taken at the time of the Siege, and some interesting groups taken in 1905 of veteran survivors of the campaign.

General Rerberg has forwarded a presentation copy of his work to the Imperial General Staff.

Recollections of the Russo-Japanese War [Воспоминания о японской войнѣ]. By **Colonel E. I. Martinov. 8vo. 402 pp. Maps. Plotak Government Press, 1910. 5/8.**

Colonel Martinov was appointed to the 143rd Zaraiski Regiment on the outbreak of the war, and commanded it throughout the operations of 1904. In this book he relates at length the part played by the Zaraiski Regiment in the great actions, and in the various minor operations of the campaign. The Zaraiski Regiment at first comes under the orders of General Stakelberg, and receives its baptism of fire at Tel-li-ssu. Later, it is transferred to the IVth Siberian Corps, with General Dobrjinski as divisional commander. The last-named officer created an unfortunate impression on meeting the regiment, fresh from its honourable action at Tel-li-ssu, by haranguing it on his own experience gained in peace manœuvres at Kasan. This general cuts a very sorry figure throughout the book. The Zaraiski Regiment plays an important part in the operations against Kuroki on the Tai-tsu-River (25th-29th August) where it particularly distinguishes itself in covering the Russian retreat, and Colonel Martinov is awarded the Georgian Cross. Colonel Martinov testifies to the benefit of offensive action in raising the moral of the soldier. On the 26th August the Zaraiski Regiment counter-attacked and drove in Asada's grenadiers, losing three officers and 130 other ranks; the success inspired the men with the spirit of the offensive, and the desire to attack was preserved in the regiment through the rest of the campaign. The most brilliant exploit of the regiment was, however, the successful recapture of the village of Endouniulu by a night attack (Shi-li-ho 12th October, 1904). The success of this operation was largely due to the careful preliminary reconnaissance of the ground. The men left their kits behind, they wore their overcoats to distinguish them from their opponents, the approach was effected in complete silence, and the attack delivered with the bayonet alone. The final action described is the Sha Ho. Colonel Martinov was entrusted with a section of defence at Lamutun on the right of the Xth Corps. Great importance was attached to the village above mentioned but eventually Colonel Martinov received written orders which directed him to withdraw if the Xth Corps fell back. Shortly afterwards the adjacent troops of this Corps began to retire, and the Zaraiski Regiment accordingly withdrew from Lamutun. Later on it was discovered that the movement of the Xth Corps was unintentionally started by the withdrawal of a unit from the front to its place in the reserve without previous notice having been given to the neighbouring units. Plans for the recapture of Lamutun were prepared, but the task was not attempted. The book throws a very interesting sidelight on the interior economy of a Russian unit in the field. The Zaraiski Regiment, had, apparently, a considerable regimental fund. The foresight of the commanding officer added to the regimental transport by local purchase, furnished the men with garments of Chinese linen for the summer, and with fur-lined jackets for the winter, with extra boots and with a cobbler's depot in Mukden for their repair. When the divisional intendance reduced the meat ration, the Zaraiski Regiment made up the deficiency from their own store beasts; and when the divisional general showed a weakness for utilising too often the mounted section of regimental scouts on detached duty, Colonel Martinov solved the difficulty by forming a duplicate scout section for his own use. The field kitchens were always on the spot when needed, and when the situation did not admit of their being sent up to the front line, the men received their cooked rations in haversacks. Any lull in the fighting was taken advantage of to issue a meal, or to order the men to sleep, and finally when the regiment went into winter quarters on an entrenched position they built themselves baths and a laundry. Such details scattered throughout the book, in spite of its modest tone, reveal the fact that the Zaraiski Regiment was fortunate in its commanding officer, whom it lost when he was appointed chief staff officer to the IIIrd Siberian Army Corps.

The book is interesting, and is written in simple style and in very easy Russian. The student of this language will find it valuable for the introduction it gives to military life, and also for the many military terms which it contains. The print is very good and the sketch maps are clear.

***Russo-Japanese War*, 1904-05 (Русско-Японская война, 1904-1905). By the Russian Military Historical Committee. St. Petersburg, 1910. 4to. 2/1/8.**

The Russian History of the War in the Far East has been compiled by a committee of three major-generals, six colonels, and one lieutenant-colonel, under the direction of Major-General Gourko.

The volumes so far issued are:

Vol. I.—Events leading up to the war. pp. 857 with three maps.

Vol. II.—First period of the war.

Part I. From the commencement of hostilities to the battle of Te-li-ssu. pp. 581.

Part II. Te-li-ssu to Ta-shih-chiao. pp. 695. Portfolio containing 35 maps.

Vol. III.—Liao-yang.

Part I. Events in July, 1904. The period of the rains.

Part II. Re-opening of hostilities on the 23rd August till the concentration of the Russian army in the Liao-yang position on the 29th August 1904.

Parts I. and II. pp. 768.

Part III. The battle of Liao-yang and the retreat to Mukden. pp. 445.

Portfolio containing 55 maps.

Vol. IV.—Sha-Ha and San-te-pu.

Part I. The battle of the Sha-Ho. pp. 507.

Part II. The winter of 1904-05 and the battle of San te-pu. pp. 536.

Supplement to Part II. The raid on Newchwang. pp. 122.

Portfolio containing 75 maps.

Vol. V.—Mukden.

Part I. The preceding events and the battle of Mukden till the issue of Kuropatkin's order for the retreat of the 1st and 3rd Armies to the Hun-Ho. pp. 686.

Part II. From the retreat to the Hun-Ho to the concentration of the Russian army on the position of Chi ping-Kai. pp. 406.

Portfolio containing 55 maps.

Vol. VI.—Chi-ping-Kai. pp. 664.

Vol. VII.—The services in rear of the army.

Part I. The organisation and command of the army in the field. pp. 571.

Part II. The lines of communication. Transport and communication. pp. 525.

Portfolio containing 64 maps.

Vol. VIII.—The defence of Port Arthur.

Part I. From the commencement of the war till the close investment of the fortress.

Portfolio containing 26 maps.

Volume VIII. has yet to be completed. The size of the whole work may be gathered from the fact that a special staff circular lays down the cost of carriage by rail in the event of the weight exceeding 120 lbs.

Credit must be accorded the committee for the rapidity of its work when it is recalled that the German Official History of the Franco-German War required nine years to write, and that the Russian Official History of the Russo-Turkish War of 1877-1878 has not yet been completed.

The work will be reviewed as it appears in the French translation.

Military Japan **(Le Japon militaire). The Japanese Army and Navy in 1910. By J. C. Balet. 233 pp., including preface, and table of contents at the end. 12mo. Yokohama: Kelly and Walsh. Paris: E. Leroux, Rue Bonaparte. 2/11.**

This is an interesting work. The military portion, to which this review is limited, comprises 158 pages and ten chapters dealing respectively with:—discipline, caste spirit, and defence budgets; recruiting and terms of service; territorial organisation, distribution of troops and organisation of units; higher commands, administration and education; conditions of services of officers and non-commissioned officers; reserves and manœuvres; peace and war establishments and armament numbers available, mobilisation, railways telegraphs, sea transport; uniforms, decorations, and pensions; regimental life, national qualities and defects. Numerous and generally accurate statistics are given; the data about colonial garrisons are, however, not up-to-date. There are some clerical errors: on page 46 it is stated that the 3rd Division was with General Nogi in front of Port Arthur, this should read "7th." On p. 50 the number of one of the cavalry regiments at Toyohashi is given as 52nd; it should be 25th: there are only 27 cavalry regiments in the Japanese army.

The most interesting chapters in the book are the first and the tenth. In the former the author speaks of an increase of insubordination and socialistic tendencies; he alleges that discontent exists on account of the favouritism which, according to his statements, is shown to men from certain provinces in allotting high posts. He declares that attempts to evade military service are numerous.

In Chapter X he discusses the Japanese character. Many of his remarks are true, although some will disagree with him when he says that lack of fixity of purpose is a Japanese national characteristic. He ascribes the great military achievements of the Japanese to a spirit of self-abnegation which, he says, must decrease with the spread of western individualistic theories. Whilst admitting that at present the Japanese army has no superior, he is evidently doubtful whether it will retain its present virtues and efficiency.

POLITICAL.

The French Colonies (Notre oeuvre coloniale). By Monsieur A. Messimy. 420 pp., with numerous tables and diagrams. 8vo. Paris, 1910. Emile Larose. 4/-.

The author of this work is a French deputy with considerable experience of Colonial affairs, a man who thoroughly believes in Colonial expansion, and has implicit faith in the future of the French colonies. The book is well worth reading by all those interested in Colonial matters, whether social, military, or administrative. It gives a good description of the most important political and economic questions affecting the various French colonies, and deals with their financial affairs an general administration. Few Englishmen realise the enormous progress made by the French colonies in the last 20 years, a result due to sound methods of administration and to an energetic forward policy. We are justly proud of our own system and of the many successes of our Colonial policy; but we are not altogether perfect, and may perhaps have a good deal to learn in some respects from our French friends.

Peace or War East of Baikal? By E. J. Harrison. 545 pp., 3 maps and numerous illustrations. 8vo. Yokohama. Kelly and Walsh, Ltd. 21/-.

The author, a journalist who has resided many years in Japan, has given a singularly impartial account of the conditions in the Far East consequent on the Russo-Japanese war, and the recent Agreements and Conventions affecting the political situation in that part of the world.

The question asked in the title is answered in the first chapter, where the writer gives it as his opinion that peace is likely to last for a decade at least, but that the final struggle for hegemony is inevitable. According to him Japan has no intention of provoking a conflict. On p. 14 he says:—

> "I cannot share the Russian belief that these preparations for war in Korea and Manchuria necessarily imply a resolve to force a conflict upon Russia on some entirely frivolous pretext. Japan on her side has an equal right to assert that the construction of the Amur railway is but preliminary to a war of revenge on the part of Russia against Japan."

The subjects dealt with in the book are:—

Chapters II. and III.—The Russian advance eastwards and the events leading up to it, the net result of which is that "a second Russian armed frontier in the remote east of Siberia from Baikal to the Pacific Ocean in spite of the economic weakness of that country, has become an inevitable necessity."

Chapters IV. to IX.—East Siberia and a voyage down the Amur river. Vladivostok, the writer says, has improved beyond recognition since the war. It suggests a "live" city more than any other port in the Far East; but, quoting the opinion of Mr. Panoff, a Vladivostok journalist with a life-long experience of the Far East; he points out the precarious position in which that city would find itself, should the network of railways now being constructed by Japan be completed before the Amur railway. He adds that the Amur railway alone will be insufficient to guarantee Russia against attack. A Japanese advance from Kirin, a town which will soon be connected by rail with Ch'ang-ch'un on the west, and with the Korean port of Chong-jin on the east, in conjunction with a descent upon the Maritime Province, would squeeze Vladivostok in a vice. A fleet strong enough to resist attack from the sea is therefore a vital necessity.

Chapters X. to XIII. deal with Russia in North Manchuria;

Chapters XIV. to XVIII. with Japan in South Manchuria. The writer considers that the enormous vested interests that Japan is building up in Dairen (Dalny) will make it impossible for China to buy her out at the expiration of the lease.

In Chapter XVIII. is discussed the Knox proposal of January 1910, to neutralise the Manchurian railways. This seems to have left a bad impression on the public mind in Japan. He shows that with a growing population expansion has become a necessity for her, and that, like every other Power, she will expand along the line of least resistance, *i.e.*, Korea and Manchuria. America has always closed her doors to Japanese immigration on the Pacific Coast, and it is not surprising that a proposal from this quarter, which would have the effect of placing her influence in Manchuria on an equal footing with that of any of the six Powers, should have excited bitter feelings in Japan.

Chapters XIX to XXI.—The Japanese in Korea. Railway projects in Korea are clearly described: the following are likely to be commenced at an early date:—

(1) Mokpo to Koang-ju, in south-west Korea, ultimately to be linked up with the Seoul-Fusan line at Taiden.

(2) Seoul to Gensan. Chong-jin, on the north-east coast, to Hoiryong; thence to be connected with Ch'ang-ch'un by the Kirin-Ch'ang-ch'un railway, now under construction, thus constituting a third line of advance from the sea into the centre of Manchuria.

Texts of recent Treaties, Agreements, and Conventions relating to the Far East are given in appendices.

There is a good map of Korea and Manchuria. In the railway map of the Far East the portion showing railways in China is misleading. Railways are shown as completed from Tsi-nan Fu and Kiao-chow to Hi-chan Fu (Yi-chou Fu?). This is incorrect. That from Kiao-chow to Yi-chou Fu is projected only, while that from Tsi-nan Fu to Yi-chou Fu is a portion of the Tientsin-Pu K'ou railway, which is now under construction.

The Persian Revolution, 1905-09. By E. G. Browne. 350 pp. with numerous illustrations, two appendices and an index. 4to. Cambridge University Press, 1910. 10/-.

The author of this work is a Professor of Arabic and a Fellow of Pembroke College in the University of Cambridge. His knowledge of Persian generally, and his personal friendship with many leading men of the country, as also his own earnest study of Persian affairs, makes him peculiarly qualified to write on this subject. A steadfast champion of the Persian Constitutionalists and their cause, and a firm believer in their power to put affairs in Persia straight, and then to govern the country on progressive lines, without any interference from the outside world, Professor Browne has endeavoured to place this point of view before the public. In his preface he states that the book is intended to be a history, and, to quote his own words, "he has endeavoured to collect, co-ordinate, and weigh all available information, and then to present as faithful a summary of the conclusions as he has been able to frame."

With such beliefs as he holds it is natural that the author should say that no amount of railways, mines, gaols, gas, or drainage can compensate the world, spiritually and intellectually, for the loss of Persia, which would be the inevitable outcome of the occupation and administration of Persia by foreigners.

Studies of Indian Life and Sentiment. By Sir Bampfylde Fuller, K.C.S.I., C.I.E. 360 pp., with map and index. 8vo. London, 1910. John Murray. 6/-.

Sir Bampfylde Fuller's work is one which should be read by all who take an interest in and are willing to try and understand the real India. Almost every phase of Indian life is touched upon; Indian problems are discussed and explained in a manner which cannot fail to be understood even by those who have not had the opportunity of visiting the country; whilst at the same time the wealth of detail and accurate description contained within the covers of the book, are never redundant. The great lesson which Sir Bampfylde seems to convey in this work is that India is not a country inhabited by a nation, homogeneous, compact, and self-contained, but a vast sub-continent wherein dwell multitudes of races, differing from each other in every way that it is feasible for human beings to vary from each other. This book possesses the rare merit of accuracy. The reader cannot fail to be impressed with the feeling that he has presented before him the results of a wide experience, close observation and deep study.

Canada and Canadian Defence. By Major-General C. W. Robinson, C.B. 186 pp., including index. 3 maps. 8vo. London, 1910. Hugh Rees. 6/-.

General Robinson's able book will perform good service if it tends to the diffusion throughout the Empire of reasoned information about one of its most important components. One of the principal factors making for closer union of our world-wide Empire is the spread of knowledge of and added interest in the aims, hopes, and aspirations of its several parts. In a series of addresses during his visit to Canada in the fall of 1908, Iord Milner pointed out how inadequate human imagination was to enable the separated parts of the Empire to feel acutely the more immediate needs of each other. If there were more books of the nature of *Canada and Canadian Defence* this inadequacy would be lessened, and it would not then be Utopian to hope for a common public opinion upon one at least of our joint problems—the military needs of the Empire.

Unthinkable as is war with the United States, General Robinson points out that Canada must pay a proper regard to the fact that for practically 4,000 miles her frontier marches with that of a powerful nation. His views upon the present needs for the protection of that frontier are based upon the lessons of the war of 1812-14, and he brings in support the opinion of the Duke of Wellington, an opinion which he rightly avers is not greatly affected by the scientific and military advance of 100 years. The outlines of the campaign referred to are set forth in brief and lucid form, lessons are deduced therefrom, and the changes since 1814 affecting these deductions are all carefully considered in the work. In the consideration of these changes and the manner in which they affect Canada's position to-day, much useful information regarding canal and railway construction and general progress in the Dominion is given in enlightening form.

The book contains three useful maps illustrating the events of the war of 1812-14 and the character of a most important part of the Canadian frontier; while Appendix III contains useful information regarding the harbours and ports of the great Dominion.

The Navies of the World and Naval Supremacy (La Marine de Guerre). By A. Sauvaire Jourdin. Illustrated by D'Albert Sebille. 372 pp. Paris. Librairie Vuibert. 8/4.

This is a well-illustrated book which deals with naval matters generally, although most of the sketches and much of the text are concerned with the French Navy in particular. The most important part of the book, however, to English readers will probably be the brief but striking preface of Admiral Fournier, who, in pleading for harmony and unity of view in the French Navy, points out that the future is full of menace. He foresees an alliance of the Pan-Germans and Pan-Islams, and is afraid that such an alliance will provoke a general conflagration unless Great Britain takes the only sure step to prevent it, namely, the creation of a powerful National army. Can and will England, he asks, save herself by merely piling up Dreadnoughts?

The book itself contains the following headings: "Naval Ports," "Naval History," "The Modern Ship of War," "Naval Artillery," "Personnel," "Navigation," "Evolutions and Tactics," "The Submarine," "The French Navy and Sailors."

A Critical Study of Tactics and of the New German Regulations (Etude critique de la tactique et des nouveaux règlements allemands). By Cammandant de Pardieu. 145 pp. Paris, 1910. Charles Lavauzelle. 2/-.

This book will be found useful by those who wish to gain a rapid insight into the spirit and teaching of the German training manuals. It consists of two parts. Part I. is a short critical summary of the German regulations for infantry, cavalry, and artillery; Part II. deals with the tactics of the three arms. In a short introduction (p. 55) to this part the author discusses what he considers the four main characteristics brought out in the German Regulations, viz., the spirit of the offensive, the development of initiative, the necessity for intercommunication, and the attack with large masses. The latter principle, in Commandant de Pardieu's opinion, pervades all the German Regulations. Following on this introduction comes a discussion of the offensive, which occupies the greater part of the book. The author contrasts the views on the tactics of advanced guards in France and Germany. The German advanced guard is, he says, a shield not a weapon of offence. Under the heading of the "Approach March" (p. 71) he explains the successive stages of deployment by which the German divisions pass from their columns of march to their fighting formations; the tendency to deploy at once in certain cases without waiting to form up in position of assembly, is noted with approval.

In the chapter devoted to battles of encounter the author calls especial attention to the forward position of the guns in the columns of march, and to the simultaneous opening of fire by the whole mass of the artillery. With regard to the latter point he remarks (p. 78):—

> "But against what will the mass of the artillery open fire? In case of a war between the French and Germans the latter will only have as targets a few of the French advanced guard batteries. If the Germans open fire with all their guns the French artillery will thereby gain definite information as to their number and positions."

As regards the infantry advance, Commandant de Pardieu notes (p. 85) the tendency of the Germans to seize and endeavour to maintain superiority of fire from the moment that fire is opened. He points out a certain want of clearness which, he says, may be intentional in the wording of the Regulations for the assault. There is, he observes (p. 90) no "decisive attack" in Germany as in France. The decision is sought for on the flanks, the flank attack being carried out in the same method as the attack on the front, but with more energy and persistence.

With regard to the attack on an entrenched position, Colonel Pardieu criticises the assumption, which the German Regulations appear to make, that the attackers will be able to gain fairly exact information as to the dispositions of the defence by means of a thorough and elaborate reconnaissance of the position.

Such information, he considers, can only be gained by attacking. "If the Germans put these principles into practice," he remarks, "they risk making a blow in the air; a false front or a line of advanced posts will suffice to mislead them."

The defence is dealt with in a much smaller space. The author appears in accord with the general principles laid down by the German Regulations. He criticises, however, the fixing of the infantry position about 600 metres in front of the artillery" as too rigid, and expresses his surprise at the comparative silence of the Regulations on the subject of counter attacks, and as to the counter offensive in general. In spite of the above criticisms and of some others which cannot be mentioned for want of space, Commandant de Pardieu appears to be in accord with the governing principles of German strategy and tactics.

Instructions for the Conduct of the Battle by Infantry (*Provisional*) (Наставление для ведения боя Пѣхотою). 72 pp. 12mo. St. Petersburg, 1910. Berzovski. 5/-

A new edition of the *Russian Infantry Training* was published in 1908, but the present pamphlet is the first work issued by Army Headquarters on the subject of infantry battle tactics since 1900, the Russian infantry having been trained during the last six years in accordance with instructions issued from time to time by the commanders of the twelve military districts.

The pamphlet has been subjected to a scathing criticism in the *Russki Invalid** of the 29th October. The writer points out that the compilers have not confined themselves to infantry tactics, but have wandered into discussions on combined training, that instead of encouraging individuality and self-reliance by inculcating general principles, a model form of attack is described, that, so far from profiting by the experience of the war in the Far East, the pamphlet is actually less up-to-date than the Instructions of 1900, that the essential features of modern infantry battle tactics are not set forth, such as the power and range of modern firearms, the depth of the battles field, the wide extensions, the length of the combat, and the slowness of the attack.

The advance into action.—A few points may be noticed:—

A force advancing will generally march in parallel columns, each of a strength of one brigade and each column will be covered by an advanced guard. Artillery positions will be chosen under cover of the advanced guard. The larger the unit, the sooner must its definite task in the attack be assigned—the army corps and the division should be launched while still outside the zone of hostile artillery fire, while the company's task is defined after the zone of rifle fire has been reached, and that of the section just before the assault.

The unit which will, it is thought, encounter most difficulty in its advance should be detailed to direct. The halt at the first fire position should be utilised to make systematic arrangements for the further advance. As the advance continues, each unit will press forward trying by its fire to relieve pressure on neighbouring units.

On arrival at the zone of distant artillery fire (7,000 to 6,000 yards) the regiment will break up into battalions, and every effort will be made to advance concealed from the fire and the view of the enemy.

The zone of effective artillery fire (6,000 to 2,400 yards), will be passed in company formation, and fire-swept areas by sections. The experience of the war in the Far East taught that artillery-fire cannot stop an infantry advance in extended order, and therefore doubling, and man by man advances need not generally be resorted to. During this period the artillery of the attack will concentrate its fire on the artillery of the defence with a view to its weakening before the arrival of the attacking infantry at the first rifle-fire position

In the zone of distant artillery fire deep and narrow-fronted formations are recommended, such as line of sections in file; under rifle fire, formations should be wide and shallow.

Dispositions in attack.—In a decisive attack a regiment of four battalions is given a frontage of 1,200 to 1,500 paces. The regiment then assigns one to two battalions to the fighting line, and these in turn detail a certain number of companies, which advance with intervals followed by their own supports. The fighting line is fed in the intervals as required by companies from the battalions in reserve, and reaches its full strength at the first rifle-fire position. The distance between successive lines in the advance, including that between the firing line and supports, will be about 600 paces.

The strength assigned to a holding attack will be less, but the difference should be rather in the reserve than in the fighting line.

Zone of distant artillery fire.—The firing line is formed at 3,000 paces, and at first consists of a single section from each company. Halts to fire up to 1,500-1,800 paces will be exceptional, and will only be made to deal with large targets. Fire will be opened at 1,500 paces, and from this range sections will support each other's advance by their fire. In order to avoid loss from distant artillery fire, the first rifle-fire position should be occupied and fortified, if possible, under cover of darkness; but such movement must be preceded in daylight by a careful reconnaissance of the approaches and their marking by recognisable signs, or better still by the occupation of the position itself during dusk by patrols.

At the first rifle-fire position a pause will probably occur to take the range to the enemy's position, to arrange for the further advance, and to enable the attacking batteries to make an impression on the hostile infantry. At the same time it is probable that part of the artillery will come up with a view to affording closer support to the further advance.

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* Army handbooks are issued by the Training Branch of the General Staff. The Russki Invalid, like the Voenni Sbornik, is edited by a Lieut.-General who is immediately responsible to the Chief of the General Staff, but prints articles from contributors of various views.

Movement in the zone of effective rifle fire.—In reinforcing, sections and squads should be kept intact as long as possible, but the intermingling of units is unavoidable as the enemy's position is approached and must be prepared for.

The choice of further fire positions will depend on the ground, the position of neighbouring units, and the enemy's fire; it must, however, be remembered that differences of less than one-third of the whole distance to the enemy's position will afford little advantage from a musketry point of view. The second fire position will therefore be, as a general rule, from 500 to 600 paces in advance of the first—say 1,000 paces from the enemy's trenches, and the fire from it, being noticeably more effective than from the first position, will have a powerful moral effect on the enemy by bringing home to him the approach of the attacking force. From position to position the advance will be by rushes, the men halting to rest and not to fire. As a rule the company commander will select the next fire position with the help of the map, and each squad will be supported in its rushes forward by the fire of the remaining squads from the first fire position. The section will not open fire from the new position till all the men have come up, in order to produce a moral effect on the defenders by a simultaneous group of hits.

As the enemy's position is approached and his fire becomes more effective, the rushes will be made by smaller units, squads, groups, and man by man, and will be for a shorter distance—say 15 to 20 paces.

In advances within point blank range each individual will construct what cover he can at each intermediate halt for the use of his comrades who follow in rear.*

The final fire preparation of the assault will be commenced when the attacker arrives at a point from which he can distinguish the heads of the defending riflemen as they raise themselves to fire. A continuous fire must be poured on the enemy's trenches.

Communication with the artillery.—Each section of the attack must be connected by telephone and by signallers with the artillery in order that the guns, being warned of a commander's intention to advance, may be enabled to overwhelm the defenders' trenches opposite that section with a rapid fire.

...The assault.—The attacker must entrench at the final fire position. The signal for the assault may be given by a junior officer and he must be supported by the simultaneous advance or by the fire of his neighbours.

Fire direction.—Fire direction finds its expression in the choice of targets and of the class of fire. In selecting a target, its tactical importance and the probability of hitting it must be taken into consideration.

The company commander is empowered to direct fire on objects behind which an enmy may be concentrated. Distances must be ascertained by the use of the range-finder, from the artillery, from the map, and only—if no other means is available—must they be estimated by eye. Under favourable conditions fire may be opened on a battery or a section from a range of 2,100 yards, upon groups or a firing line in movement at 1,250 yards, upon individuals advancing or a firing line lying down at 850 yards.

Volleys, being less than half as effective as individual fire should only be rarely employed.

The Defence.—A force, by assuming the defensive, may cause the attacker great loss while suffring few casualties, but decisive results can only be obtained by moving forward to the attack, and the continued uncertainty regarding the attacker's plans though the prolonged strain of the modern battle wears the defender out.

The streagth of the defence lies in its fire and in the manœuving power of the reserve. The usual position will be a long, irregular weakly held, frontal line with fire swept intervals. econd line and supporting positions will be held in rear and the flanks will be thrown back to avoid envelopment.

Fortifications and trenches must be mutually supporting. The experience of the war proved that trenches on the crest line are inadvisable. Every trench should afford protection from shrapnel, *i.e.*, should have a depth of 6 or 7 feet, or should be provided with loopholes. Communication trenches are almost as important as fire trenches. The infantry must be independent of engineer assistance in the fortification of a position.

The position for the batteries will be selected by the senior artillery officer in the section. It will be found necessary to move batteries during action, and firing over the head of the infantry is permitted:—

(a) On level ground, when the guns are firing at a range of 2,100 yards and over, and the infantry are at least 700 yards in front.

(*b*) When the guns fire from a position 35 feet above that of the infantry, the interval need only be 230 yards.

(c) If the infantry are provided with cover in rear, the interval may be less than 230 yards, but the trajectory must pass at least 35 feet above the ground they occupy.

The object of advanced posts is, by impeding the hostile reconnaissance, to mislead the attacker regarding the dispositions of the defence, and to force him to disclose his strength. The garrison of these posts will be found by the outpost troops, the positions being previously prepared either on the picquet line or in the neighbourhood of the outpost reserve. No artillery will be detailed, as

* The critic in the *Russki Invalid* remarks, "An impossible demand from even the best infantry."

the posts will be within range of the guns of the main position. The garrison will not be reinforced from the main position to which it must eventually retire.*

The distance to conspicuous objects must be measured beforehand, and a table of the ranges affixed to a board should be hung up in the trenches of the firing line.

Fire may be opened at the same range as recommended in the attack. The local reserves are designed for replacing casualties in the firing line and to assist in repelling the final assault.

The general reserve is kept for the decisive counterstroke, which will be directed as a rule against the enemy's flank. The more obscure the situation, the stronger the reserve should be. It should be placed on the most important or most threatened flank, and at a much greater distance in rear than has hitherto been the custom, with the two-fold object of avoiding useless participation in the nerve strain of the combat and of enabling its units on deployment to strike the flanks of the enemy's outflanking columns.

Communication.—Communication will be maintained by:—

(*a*) Orderlies.
(*b*) A chain of orderlies.
(c) Flag and lamp signalling.
(*d*) Telephones and telegraphs.
(*e*) Attaching officers or selected men to neighbouring units.

Flag and lamp signalling must be used by company, battalion, and regiment commanders to supplement orderlies and telephones. The use of a chain of orderlies is recommended as being more reliable than the dispatch of single messengers. The responsibility of organising communication by chain of orderlies or flag with his superior commander rests in each case with the commander of lower rank.

Communication by telephone is arranged by the senior to the junior commander. Thus the regimental commander with five telephones and 5 and 1-3rd miles of wire must arrange communication with battalion commanders, with the artillery, and with detachment units of his command, the divisional commander with his brigadier, etc.

In an attack, the divisional central telephone station will be near the artillery and 2 to 3 miles from the enemy's position, that of the regiment about 1,500 yards from the enemy and near the first rifle-fire position.

Communication with neighbouring units will be maintained through the central station, i.e., regiments will communicate through the divisional central station, and a line may sometimes be laid between the regiments of different divisions or corps.

In the defence, telephonic communication will be arranged with advanced posts.

Officers and men detached to neighbouring units for communication purposes will remain near the commander of that unit, and despatch reports to their own unit as required.

An officer in each battalion will be detailed to superintend the service of communication.

Reconnaissance.—The duty of reconnaissance by infantry is treated in two chapters:—before and during the battle.

The reconnaissance before action will be carried out by:—

(*a*) Officers preferably alone but sometimes accompanied by small patrols. The battalion adjutants who are mounted are specially indicated for this duty.
(b) The regimental scouts (four men per company, or 64 per regiment), who will work up to a distance not exceeding half a march in advance of the advance guards. They will maintain communication with the advance guards by means of the mounted orderlies (of whom there are 13 in each regiment), supplemented, if necessary, by men from the corps or divisional cavalry.
(*c*) Commanders down to company leaders, of the ground upon which their units will probably be called upon to manœuvre.

During the battle the duty will be carried out by:—

(*a*) Unit commanders who will occasionally move forward for the purpose.
(*b*) Specially trained observers. These will be prepared in each company in addition to the scouts (*razvyedchiki*) who will be usually at the disposal of the regimental commander in action.

Protection of the flanks.—Outflanking movements have become the normal rule and are equally effective in attack and defence. The immediate protection of the flanks cannot be entrusted to the cavalry, but in forces of a strength of more than a battalion should devolve on scouts supported by picquets, strengthened at night by stronger parties detailed from the local reserves.

Machine guns.—The chief opportunity for the use of machine guns lies in the final assault, after the volume of artillery fire has dwindled owing to the danger of striking its own infantry (750 to 650 yards and under). At longer ranges machine gun fire will be used only for sweeping areas. The guns will be advantageously employed by advanced and rear guards, in advanced posts, and to accompany small parties of infantry in outflanking movements, as well as to sweep with their fire important lines of hostile approach and defiles.

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* The critic in the *Russki Invalid* is of opinion that advanced posts played too important a role in the last campaign for their garrison to be limited to the outpost troops, who would be altogether too weak to achieve the ends desired

In the attack, machine guns will be at first with the battalion and regimental reserves. They will be moved forward into the firing line at effective rifle range or even at the final fire position.

Machine guns in the defence must be carefully protected from artillery fire. They should be used boldly to repel the final assault, and to increase their effectiveness should be provided with two or three alternative emplacements with covered communication trenches.

Cavalry Taught by Experience. By "Notrofe." 64 pp., with map. 8vo. London, 1910. Hugh Rees. 2/6.

This little book is recommended as an interesting study of an imaginary reconnaissance by a British cavalry brigade, commanded by Major-General A.

The study is based on an imaginary campaign in an imaginary country. The problem is a simple piece of reconnaissance, and is dealt with in three attempts in the style of Duffers Drift. The first two attempts are failures, the third a success. In the latter the dispositions of his enemy rather play into the hand of Major-General A. and may be looked on as somewhat Utopian. Certain of the arrangements made, such as the placing of the whole of a rearguard in motor cars (p. 52), and the reconnoitring of an enemy's lines by pairs of scouts (p. 49) instead of by patrols, may be open to question, but on the whole the book furnishes valuable lessons besides being very readable.

The summing up on p. 64 is excellent.

Infantry Tactical Problems (Thèmes tactiques d'Infanterie). By Major Savatier. 248 pp. Paris. Lavauzelle. 3/4.

This is a useful book which should prove of assistance to officers studying the tactics of the principle arm. The author takes a simple scheme, and works out the movements of a battalion or company in advanced, rear and flank guards, outposts, attack and defence of positions. The solutions are based entirely on the French official regulations. There is no map with the book, but all the operations take place on the $\frac{}{50,000}$ map of Metz.

Between the Adda and the Isónzo: the Defence of Italy's Eastern Frontier (Fra Adda e Isonzo: Difesa del confine orientale). By Colonel T. Nagliati. 208 pp. 8vo. Rome, 1910. Voghera. 8/4.

Colonel Nagliati's book is divided into three parts. In the first he deals with and criticises the accepted principles of modern fortification, particular mention being made of the effects of the indirect laying of artillery and of aerial reconnaissance. In the second, the author makes a close analysis of the strategical and topographical situation on the Austro-Italian frontier. In the third part suggestions are made as to best manner of defending that frontier by land and sea, with an estimate of the probable cost of the measures suggested.

Spanish Cavalry Training. Vol. IV. (Reglamento provisional para la Instruction tactica de las Tropas de Caballeria.) Spanish General Staff. 131 pp. 12mo. Madrid, 1910. 1/2.

Volume IV. of the new *Spanish Cavalry Training* deals with "Combats and Manœuvres"; it supersedes a similar handbook published in 1901.

The strategic handling of cavalry does not come within the scope of the book, which deals exclusively with the tractical handling of the arm.

The dominant feature is insistence on the value of the spirit of the offensive as exemplified in phrases such as "inaction is the only unpardonable sin." About 20 pages out of 131 are devoted to dismounted action, it being stated that mounted action is the rule, dismounted action the exception.

The following are some of the points dealt with:—

Cavalry v. Cavalry.—The approach march is to be conducted in successive "bounds" covered by protective bodies, composed of sections or squadrons. The actual conduct of the fight must depend on the attendant circumstances, but the following principles should be adhered to:—

(a) A definite plan of attack should be formed best suited to the ground, the forces available and the enemy's dispositions.

(b) The force should be divided into different groups of combat, each with a distinct mission.

(c) Unanimity of action must exist between the various groups. It may be necessary to keep connection between them for this purpose, but such connection is not to interfere with the carrying out of the mission assigned to each group.

(d) The troops should be disposed in depth.

Cavalry v. Infantry.—The elements of a successful attack on infantry are as follows:—(1) Surprise; (2) The enemy's physical exhaustion; (3) Weakness of the enemy's fighting power owing to a weak firing line, shortage of ammunition, change of position, &c.

It would be most foolish to launch cavalry against unshaken infantry without fire preparation. But cavalry, with its attendant horse artillery and machine guns, now possesses such increased fire power that it is by no means impossible that it may defeat hostile infantry without assistance.

Dismounted action.—This increased fire power must not, however, be abused; it has not altered the fundamental principle of cavalry employment, which is offensive action. Fire should be used to develop that principle, not as a substitute for it.

In the attack the employment of dismounted cavalry is not altogether dissimilar to that of infantry. They should advance in skirmishing order and will occupy successive fire positions. The method of advance should usually be by section rushes. Supports should not usually be employed, but a mounted reserve should be kept in hand to be used either mounted or dismounted, as circumstances may direct.

In the defence the firing line should usually occupy the crest line, unless there is much dead ground when it should be advanced along the forward slope.

Pitched battle.—The efficiency of cavalry action depends on the position of the cavalry during the different phases of action. During the preliminary reconnaissance cavalry take a leading part in the reconnaissance work, after which they should be withdrawn to the line of the reserve. During the decisive attack cavalry must be energetically employed in co-operating with the other arms to force a decision.

Spanish Musketry Regulations (Raglamento Provisional para la Instruction de Tiro de las Tropas de Infanteria). Spanish General Staff. 193 pp., with numerous plates. 12mo. Madrid, 1910. 2/-.

These Regulations supersede those issued in 1907, and presumably embody the lessons learnt by the Spanish troops during the Melilla campaign.

The book is divided into two parts, the first dealing with musketry instruction and practices, the second with materiel and ranges.

Instruction.—Great latitude is given to the company commander. The Regulations lay down the general lines on which the preliminary training and instructional practices are to be conducted, but although the manner of carrying out the annual course is suggested, it is explicitly stated that company officers need not strictly adhere to the suggested course. The number of rounds to be expended annually are fixed by the Officer Commanding the regiment, and will usually be from 100 to 160 per trained soldier and 200 rounds per recruit.

Classification.—The ring targets are marked into ellipses for first, second, and third third class shots. First class shots score two points in each practice, second class one point. At the conclusion of the course an average of 1.33 points qualifies for a first class shot, .66 points for a second class. The ellipses are of generous size, that of first class shots being 8½ by 7 inches at 50 yards lying, and 48½ by 42½ inches at 400 yards. Two-thirds of hits within the first class ellipse qualifies the firer as a first-class shot for that practice. In practice 9.57 per cent. of hits qualifies for first class shot, 39 per cent. for second.

Education.—Progressive courses of instruction in musketry will be carried out by all officers and non-commissioned officers. These will include judging distance, range finding with telemeters, designation of targets, studies of ground from the point of fire effect and small tactical instructional days.

Across Abyssinia (Quer durch Abessinien.) By Dr. Jacques Faïtlovich. 188 pp. 1 map. M. Poppelauer. Berlin, 1910. 8vo. 6/-.

Although this book is called *Across Abyssinia*, the journey undertaken was as a matter of fact confined to the country between the northern boundary and Addis Abbaba. It is the second time that Dr. Faitlovich has travelled in Abyssinia, the previous occasion being in 1904-05, but on both occasions his main objects were to traverse the country inhabited by that portion of the Abyssinian race who still profess the Semitic faith.

It will be recollected that in early days the Hebrews are said to have had considerable intercourse with the ancient Ethiopia, and according to the Abyssinians, the present dynasty is descended from Solomon himself. However, there are but few Abyssinians nowadays who are Jews by religion and those that remain are known as "Falashes," located in the northern districts.

Dr. Faitlovich's route lay from Eritrea down through Gondar to Lake Tsana; and around this locality as far as Debra-Tabor the Falashes were chiefly encountered. From Debra-Tabor, the route to Addis Abbaba was taken, and thence a return route direct through Ankober to Massowah.

In Debra Tagor, a visit was paid to Ras Guksa, the nephew of the Empress, and in Addis Abbaba, Dr. Faitlovich had an audience of the Emperor Menelek himself. The chapter describing his stay in the capital is interesting, and there is a good deal of useful information contained in the book.

Mission Niger-Tchad, 1906-09 (Documents Scientifiques de la Mission Tilho, 1906-09). 412 pp., with numerous illustrations and 3 maps in separate case. Paris. Imprimerie Nationale, 1910. 20/-.

The above deals with the observations made by Captain Tilho's expedition to Lake Chad and the country round it. The observations are dealt with under five headings.

(1) Geographical.
(2) Astronomical.
(3) Meteorological.
(4) Altitudes.
(5) Magnetic.

The geographical observations are subdivided into three chapters dealing with:—

(*a*) Former explorations of Lake Chad.
(*b*) The work of this expedition.
(*c*) Conclusions arrived at concerning the normal level of the lake and the extent of the islands in it.

The astronomical observations are in two chapters, dealing with:

(*a*) Observations for longitude by means of chronometers; these were carried out with great care by making observations at the various points of closed polygons, thus furnishing a check on the rates of the various chronometers used.

(*b*) Observations for obtaining the longitudes of 70 places by means of occultations of stars by the moon.

The meteorological observations are in four chapters dealing with:

(*a*) Observations made in 1907 under nine separate headings.
(*b*) Similar observations made in 1908.
(*c*) General remarks on the climatic conditions of the country round Lake Chad.
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Altitude observations were made at all the places visited, by means of barometers and hypsometers, both sets of instruments being compared with standard ones in Paris before and afer their use in Africa.

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With the exception of the chapters devoted to former expeditions to the Lake, and to the description of the country, the book is chiefly of scientific interest, and it appears to contain the best and most complete information of this part of Africa that has yet been published.

Map to Illustrate the Indian Mutiny, 1857, *with Notes and References*. London, 1910. Foster Groom. 2/6.

This publication is one of the "Whitehall Series of Military Maps," specially produced for Military History Examinations. It consists of a folding map of India, showing the communications and garrisons as they were in 1857, with an inset showing the present Indian railway systems. Three pages of notes on the Mutiny, giving a general *resume* of the whole situation, are attached to the inside of the cover. The notes include a few observations on the lessons to be drawn from the operations. Small flags to assist the student to mark the dispositions of the forces during the campaign are contained in an envelope enclosed with the map.

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